

2005 Civil Engineering Profession in Europe

*A review of the profession in Europe today
from education to professional practice*



European Council of Civil Engineers

EUROPEAN COUNCIL OF CIVIL ENGINEERS (ECCE)

The Civil Engineering Profession in Europe 2005

The year 2004 marked a historic enlargement of the European Union. There are now 25 Member States and further countries seeking accession in the course of the coming decade. The **European Council of Civil Engineers (ECCE)** wishes to mark the enlargement by presenting the civil engineering profession in Europe today through the eyes of the professionals themselves.

In doing so ECCE is not looking at construction figures, nor major projects, but at the education, training and professional practice of civil engineers ranging from the northern tip of Finland across the European continent to the northern shores of the Mediterranean Sea. The geographical diversity of our membership includes Portugal and Ireland on Europe's western reaches and Russia and Turkey to the east.

The Editorial Board is extremely grateful to those members who gave freely of their time to research, collate and submit the information on behalf of their organisations over the last year and more. This has enabled us to present this volume to give an overview of the state of the civil engineering profession today.

The "**Civil Engineering Profession in Europe**" was first published in the early 1990s when ECCE was a much smaller organisation than it is today. A second edition appeared in 1998 and today's volume represents the third edition, encompassing contributions of our 22 member organisations, together with educational information supplied by the Japan Society of Civil Engineers – who also provided some practice-related information - and the American Society of Civil Engineers. ECCE, thus, is greatly indebted to our partner organisations in Japan and the USA for responding and contributing to this paper.

The **European Council of Civil Engineers** seeks to serve the public at large as well as fellow professionals by providing up-to-date information about the **Civil Engineering Profession in Europe 2005**. We hope that the text and related summaries will provide a comprehensive view and form a basis on which the development of the civil engineering profession in the 21st Century may be judged.

Yrjö Matikainen
President

Carsten Ahrens
Vice President

Diana E Maxwell
Secretary General

September 2005

EUROPEAN COUNCIL OF CIVIL ENGINEERS (ECCE)

ECCE's historical background

The **European Council of Civil Engineers (ECCE)** was created in 1985 out of the shared concerns of the professional bodies for Civil Engineers in Europe. They were convinced that by working together, Civil Engineers across Europe could offer much more to assist Europe advance its built environment and protect the natural environment.

ECCE member organisations

ECCE comprises 22 member organisations throughout Europe. Only one organisation may represent any given country. Each of our member organisations represents individual professional civil engineers in its own country.

At June 2005 ECCE comprises the following member countries:

Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia*, Lithuania, Poland, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Turkey, United Kingdom.

(Latvia* has applied for full membership in 2005).

All our member countries have participated in this project. Two national organisations with which ECCE has long been associated have also contributed – the American Society of Civil Engineers and the Japan Society of Civil Engineers.

ECCE's aspirations and achievement for the profession and for society as a whole

ECCE has a consistent set of objectives:

At the European Union level, ECCE aims to promote the highest technical and ethical standards, to provide a source of impartial advice, and promote co-operation with other pan-European organisations in the construction industry.

ECCE also advises and influences individual governments and professional institutions, formulates standards and achieves a mutual compatibility of different regulations controlling the profession, and formulates standards for a European Code of Conduct of the Civil Engineering Profession and disciplinary procedures applicable throughout the Union.

ECCE formulates guidelines to maintain and raise standards of civil engineering education, training and professionals' competence, as well as assisting in achieving mutual compatibility of Euro-codes, standards and regulations in the related industry and encouraging and improving levels of safety and quality in the industry.

ECCE is active in such areas as the environment, research and development, education and training, ethics, continuing professional development, transportation and liability, as well as organising workshops and conferences.

ECCE meets twice a year. Meetings rotate around Europe, each being hosted by a different member organisation. To find out more about our activities, please consult our web-site: <http://www.eccenet.org>

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**INTRODUCTION TO THE
CIVIL ENGINEERING PROFESSION IN EUROPE
2005**

ECCE's MEMBER ORGANISATIONS,

IN THEIR OWN WORDS...

CROATIA (HR)

Croatian Association of Civil Engineers (HSGI)

The Croatian Association of Civil Engineers (HSGI) is the association of Civil Engineering Societies operating in the larger towns in Croatia. Its members are civil engineers, regardless of their professional affiliation. Students of civil engineering and retired engineers may also be members. The members are organised in 30 societies located in major towns and counties of the Republic of Croatia and in the following specialised societies which are members of the HSGI: Society of Structural Engineers, Society of Geotechnical Engineers, Society for High Dams, Project Management Society, Construction Management Society, Society for Hydrotechnical Works, Highway Engineering Society, etc.

HSGI membership is not mandatory. Every member regularly receives the monthly journal *Građevinar* (Civil Engineer), which is a renowned scientific-professional journal with a monthly circulation of 4,000 copies.

In the scope of its annual programme, HSGI organises various training sessions, courses and seminars, and other significant events for the further education of its members. Thus as many as 600 persons complete various courses organised by HSGI each year. At the main four-year event, the "Congress of Croatian Builders", the members discuss relevant topics of interest to their profession. HSGI also has a long standing tradition in publishing. Every year it publishes 4-5 professional titles, of which at least two to three have the status of university-level textbooks.

In Croatia, there are currently some 6,000 graduate civil engineers (with university diploma) and 4,200 civil engineers (with high school diploma), although it should be noted that no official statistics are available in this respect.

Licensed engineers and architects involved in the design, supervision of construction works, and project inspection/monitoring activities, are grouped together in the Croatian Chamber of Architects and Engineers in the Construction Industry. The Chamber has five Chapters (Architects, Civil Engineers, Survey Engineers, Electrical Engineers, and Mechanical Engineers). Each Chapter performs its activities quite independently from the umbrella organisation. Thus the Chapter of Licensed Civil Engineers, with as many as 3,100 active members, is the formal member representing Croatia in ECCE.

The Chapter of Licensed Civil Engineers and the Croatian Association of Civil Engineers cooperate quite closely with one another and even have a joint Board for International Cooperation. The information about international activities is regularly distributed to all members.

Number of active members in the organisation (in its five Chapters)

2,600 architects
3,100 civil engineers
1,700 electrical engineers
600 geodetic engineers
125 mechanical engineers

Form of legal establishment: Established in accordance with legal requirements.

Associated societies: Croatian Engineering Association (HIS) (see below)
Croatian Association of Civil Engineers (HSGI)
Joint activities based on mid-term and short-term (annual) planning

The Croatian Engineering Association is the umbrella association for all engineering societies in Croatia. Its members are:

- Hrvatsko agronomsko društvo (Croatian Agricultural Society),
- Udruženje hrvatskih arhitekata (Association of Croatian Architects),
- HO CIGRE (Croatian National Committee of the International Council on Large Electric Systems),
- Hrvatski elektroinženjerski savez (Croatian Electrical Engineering Association),
- Hrvatski savez građevinskih inženjera (Croatian Association of Civil Engineers),
- Hrvatsko društvo građevinskih konstruktora (Croatian Society of Structural Engineers),
- Hrvatsko geodetsko društvo (Croatian Geodetic Society),
- Hrvatsko društvo za goriva i maziva (Croatian Society for Fuels and Lubricants),
- Hrvatsko društvo kemijskih inženjera i tehnologa (Croatian Society of Chemical Engineers and Technologists),
- Hrvatsko društvo za kvalitetu (Croatian Society for Quality),
- Hrvatsko društvo za mehaniku (Croatian Society for Mechanics),
- Hrvatska udruga za mehaniku stijena (Croatian Society for Rock Mechanics),
- Hrvatska udruga za mehaniku tla i geotehničko inženjerstvo (Croatian Society for Soil Mechanics and Geotechnical Engineering),
- Hrvatsko mjeriteljsko društvo (Croatian Metrology Society),
- Hrvatsko metalurško društvo (Croatian Metallurgical Society),
- Hrvatska udruga naftnih inženjera i geologa (Croatian Society of Oil Engineers and Geologists),
- Hrvatsko društvo održavatelja (Croatian Maintenance Society),
- Društvo za kulturu pejzaža (Landscape Preservation Society),
- Društvo za plastiku i gumu (Society for Plastics and Rubber),
- Udruga za promicanje zaštite ljudi u radnoj i životnoj okolini (Society for the Protection of People in their Working and Living Environment),
- Udruga hrvatskih rudarskih inženjera (Society of Croatian Mining Engineers),
- Hrvatski strojarski i brodograđevni inženjerski savez (Croatian Mechanical Engineering and Shipbuilding Association),
- Hrvatsko šumarsko društvo (Croatian Forestry Society),
- Hrvatski inženjerski savez tekstilaca (Croatian Textile Engineering Association),
- Hrvatsko vakuumsko društvo (Croatian Vacuum Society),
- Hrvatsko društvo za zaštitu materijala (Croatian Society for Materials Protection),
- Hrvatska udruga inženjera i tehničara za osiguravanje plovidbe zrakoplova (Croatian Society of Air Traffic Control Engineers and Technicians),
- Hrvatski laboratoriji - CROLAB (Croatian Laboratories - CROLAB).

The Government body certifying eligibility to represent civil engineers:

Ministry of Environmental Protection, Spatial Planning and Construction of the Republic of Croatia, Republike Austrije 20, 10000 Zagreb, Croatia

e-mail: mzopu@htnet.hr

Address and contact details:

Croatian Chamber of Architects and Engineers in Construction Industry (HSGI)
(Chapter of Licensed Civil Engineers)

Address: Trg bana J. Jelačića 4, 10000 Zagreb, Croatia

Phone: (+385 1) 4854 411

Fax: (+385 1) 4855 668

E-mail: hkaig@zg.htnet.hr

Internet: www.hkaig.hr

CYPRUS (CY)

Cyprus Council of Civil Engineers (CyCCE)

The Cyprus Council of Civil Engineers (CyCCE) was established by the two Civil Engineers' Associations of Cyprus in 1995. The main purpose of CyCCE is to facilitate a common representation of Cypriot Civil Engineers in European and international societies and institutions. Any Civil Engineers' Association formed in Cyprus according to Cyprus law, can apply to become a member of the CyCCE.

The two Associations forming the CyCCE are at present:

- (a) The Cyprus Civil Engineers and Architects Association (CCEAA) and
- (b) The Cyprus Association of Civil Engineers (CACE)

The CCEAA was established in 1956 and has 1,340 members, 965 of whom are civil engineers and 345 architects. The CACE was established in 1992 and has 765 members all of whom are qualified civil engineers. Each Association has district branches each having its district council.

The aim of the Associations is to promote the scientific and professional knowledge of their members, support their professional image in society, support their rights and economic interests and ensure that civil engineers perform their duties in a professional and ethical manner for the benefit of the society.

Altogether the Cyprus Council of Civil Engineers has 1,600 members.

Form of Legal establishment: The Associations forming the Cyprus Council of Civil Engineers are legally registered Associations in accordance with Cyprus legislation two "societies" (Associations) are part of our organisation

- (a) Cyprus Association of Civil Engineers and
- (b) Civil Engineers and Architects Association

The Official organisation certifying eligibility as the body to represent civil engineers is the:

Cyprus Technical Chamber
P.O. Box 21826, 1513 Nicosia, Cyprus
Fax No.+ 357 22 730373, e-mail Cyprus@etek.org.cy

Address and contact details:

Cyprus Council of Civil Engineers (CyCCE)

Address: Bridge House Block A, P.O. Box 23334, 1681 Nicosia, Cyprus

Phone: (+ 357) 22 672866 **Fax:** (+ 357) 22 674650

E-mail: cyace@cytanet.com.cy **Internet:** www.cyace.org.cy and www.cceaa.org.cy

The Turkish Association of North Cyprus is part of ECCE's membership and is to be contacted at the following address:

Address and contact details: Administrative Mailing address : Kibris Türk Mühendis ve Mimar Odalari Birliği (IMO), President: Salim Pijale
1 Şehit İbrahim Ali Sokak, Çaglayan, Lefkosa, Mersin 10, TURKEY

CZECH REPUBLIC (CZ)

Institution of Structural and Civil Engineers (CSSI) and Chamber of Certified Engineers and Technicians (CKAIT)

The Czech Institution of Structural and Civil Engineers (CSSI) is an organisation with a very long tradition. It was established more than 100 years ago in 1865.

The Head office of the Institution is in Prague. There is a network of 12 regional branches within the Czech Republic. Some technical and professional associations (for example: Concrete Association, Geotechnical Association) are members of the CSSI.

The number of individual members of CSSI is about 2,200 engineers. Membership is on a voluntary basis.

CSSI was first invited as an observer to ECCE in 1990 and attained full ECCE membership in Paris in 1997.

The Institution is also represented in ECCE (on the base of bilateral agreement) by the Czech Chamber of Certified Engineers and Technicians (CKAIT). The Chamber, being a self-governing organisation, was established by the Act of the Czech National Council No. 360/92 Coll. regarding Certified (Chartered) Architects and Certified (Chartered) Engineers and Technicians.

At present there are approximately 22,000 members of the Chamber (about 14,000 engineers and 8,000 technicians).

Both organisations co-operate at home and abroad.

Address and contact details:

CSSI and the CKAIT is the same:

Address: Sokolska Street, 120 00 Praha 2, Czech Republic

Phone (+420) 227 090 127

Fax: (+420) 227 090 120

E-mail: ckait@ckait.cz or jplicka@ckait.cz **Internet:** www.ckait.cz or www.cssi-cr.cz

ESTONIA (EE)

Estonian Association of Civil Engineers (EEL)

The Estonian Association of Civil Engineers (EEL) was founded on February, 9th, 1991 by 124 founders.

EEL is a voluntary and non-profit association for civil engineers.

The goals of the Estonian Association of Civil Engineers are to:

- forward the development of construction;
- be a connecting link between university trained engineers active in construction;
- protect the common interests of the membership;
- develop the proficiency of the membership;
- take part in the creation of civil policy in technics, science and education;
- advance foreign relations of the EEL and its membership.

The highest directing body of the Estonian Association of Civil Engineers is the Chamber of Representatives. All members are called to participate in the work of the Chamber of Representatives. Based on the results of the elections the Chamber of Representatives appoints the Council of the EEL for the term of three years, the chairman and two vice chairmen. The latter belongs to the Council of the EEL as the chairman and vice-chairmen.

The activities of the EEL are organised by a managing board.

The present chairman of the EEL is Holger Karema, the managing director is Mrs. Kai Kilu.

Number of members in The Estonian Association of Civil Engineers (EEL): 350

Form of legal establishment: The Estonian Association of Civil Engineers is a legally registered association in accordance with Estonian legislation.

EEL has two collective member societies:

- Estonian Geotechnical Society
- Estonian Society of Heating and Ventilation Engineers

EEL is a member of the Estonian Association of Engineers and of the European Council of Civil Engineers (ECCE)

Address and contact details:

Estonian Association of Civil Engineers (EEL)

Address: Rävåla pst.8 – B211, 10143 Tallinn, Estonia

Phone / Fax: (+372) 6604524

E-mail: eehinsl@trenet.ee

Internet: www.ehitusinsener.ee

FINLAND (FI)

Finnish Association of Civil Engineers (RIL)

RIL, founded in 1934, is an organisation for Civil Engineers with Master of Science degree (or higher) and university students of civil engineering. RIL has a total of 5,000 members, of whom 3,500 are Civil Engineers. RIL unites the highest educated professionals in civil engineering within a versatile and highly regarded network. RIL also supervises the interests of its members and promotes their welfare and professional skill. A corporate member is the Society of Heating Engineers in Finland, founded in 1959, which is an organisation for engineers M.Sc. (Tech) working in the area of heating engineering.

Professional activities cover the expertise of the members (construction, design, project managing, supervising, material technology, research & development, ICT etc.) in different areas of civil engineering:

- building
- roads & traffic
- water & environmental engineering
- soil & ground engineering
- bridge engineering
- building material industry
- information technology
- property management

An important goal of the activities is to develop and promote the quality and safety of the built environment and the productivity of the building processes. That includes, for example, taking part in the development of Codes of practice, own publishing activities, influencing the legislation and governmental decisions and taking part in R&D activities. Promoting the education of civil engineers is also an important issue

On a personal level, RIL's aim is to raise the professional knowledge and skill of its members and other actors in civil engineering. That includes promoting lifelong learning, arranging high quality training courses, organising international conferences, arranging civil engineering competitions, awarding remarkable professional achievements and providing the members with up-to-date news from the industry. RIL is also a key member in the Organisation for Certification of Professionals in the Civil & Building Industry (FISE), which was founded in 2002. This voluntary-based certification system covers a wide range of professions (design, managing, supervising, etc.) and education bases (civil and building engineers, architects and technicians).

RIL's aim is also to activate and promote a high level of international activities, at both personal and organisational level. Methods to achieve this aim include organising international conferences and symposia and taking part in scientific and technical co-operation projects. RIL is a member of several international organisations.

RIL's form of legal establishment is as a Registered Association (which is subject to VAT), but RIL also has a foundation "RIL Foundation" which is not liable to this duty.

Address and contact details:

Association of Finnish Civil Engineers (RIL)

Address: Dagmarinkatu 14, 00100 Helsinki, Finland

Phone: (+358) 9 6840 780

Fax: (+358) 9 588 3192

E-mail: ril@ril.fi

Internet: www.ril.fi

FRANCE (FR)

Conseil National des Ingénieurs et Scientifiques de France (CNISF)

Officially registered on 22nd December 1860, the CNISF (Conseil National des Ingénieurs et Scientifiques de France) is organised as a Federation, comprising 160 Alumni Associations of Schools of Engineering, 30 Scientific, Technical and Professional Associations, a network of 24 Regional Associations, and 13 Foreign Sections. Altogether, CNISF comprises 160,000 members and represents approximately 450,000 Engineers and Scientists.

The main goals of CNISF are:

- to promote, maintain and defend the moral, cultural, and economical interests of engineers and scientists,
- to improve the contribution of scientific and technical progress to French economic and social development,
- to contribute towards the thinking of public authorities, firms, institutions and high schools on the development of training and of the engineering professions.
- to participate in the dissemination of information dealing with scientific and technical progress.

CNISF maintains a Register of more than 500,000 engineers, “Ingénieurs Diplômés” and engineers who have risen from the ranks.

The main sectoral activities are carried out through Committees such as:

- Energy
- Innovation
- Transport
- Environment
- Science and Society
- Formation (Training and Professional Development) of Engineers
- Economic Intelligence and Security
- Promotion of The Engineers’ Professions
- Civil Engineering, Building and Public Works (ECCE correspondent)

Other topics are worked on in temporary Working Groups, such as “Engineers’ Ethics”, “Industrial Risks”, etc...

CNISF works with many French partners (Academy of Technologies, commissions, institutes, etc.) and cooperates with international organisations (mainly in Europe, including ECCE, but also organisations in North America and in Asia).

Address and contact details:

Conseil National des Ingénieurs et Scientifiques de France (CNISF)

Address: 7 rue Lamennais, 75008 Paris, France

Phone: (+33) 1.44.13.66.88

Fax:: (+33) 1.42.89.82.50

E-mail: mtperrin@cnisf.org

Internet: www.cnisf.org

GERMANY (DE)

Deutsche Sektion des ECCE (German Section of ECCE)

The **Deutsche Sektion des ECCE** represents approximately 4,000 civil engineers..

The form of legal establishment : The German Section of the European Council of Civil Engineers is legally registered by the district court Starnberg under the number 1006.

The German Section of ECCE is a professional association with personal members and member associations in the field of civil engineering.

Membership of professional organisations such as the Union Beratender Ingenieure e.V.- U.B.I.-D. or Bundesingenieur- und Architektenverband e.V.- BIAV is on a voluntary basis.

The German Section of ECCE was established in 1992 and attained full ECCE membership in 1994.

The main goals of the German section of ECCE are:

- to collaborate in the committees of the European Council of Civil Engineers
- to represent the profession of the German civil engineers in Europe
- to improve and harmonise the regulations in the construction industry
- to promote high technical standards
- to support an international exchange of members and the common interests of engineers
- to maintain a high professional standard

In addition the German section of ECCE places much emphasis on attracting and involving all civil engineering members of the German Verein Deutscher Ingenieure (VDI) and the German Chamber of Engineers (BingK).

Address and contact details:

Deutsche Sektion of the European Council of Civil Engineers (ECCE)

Address: Edelsbergstrasse 8, 80686 München, Germany

Phone: (+49) 89.5700 7-0

Fax: (+49) 89 5700 7260

E-mail: info@ecce-germany.de

Internet: www.ubi-d.de (provisional)

GREECE (GR)

The Association of Civil Engineers of Greece (ACEG)

Association of Civil Engineers of Greece (A.C.E.G.---Σ.Π.Μ.Ε.) has 17,000 diploma civil engineers as members from every part of Greece.

The A.C.E.G. was established in 1961 as a private civil association by Court permission. There are not associated societies but local branches in the main cities of Greece.

ACEG operates as an independent scientific non-profit organisation. Its goal is to further enhance the scientific level of Greek civil engineers, to defend their financial & professional interests and to participate in the study and application of national programmes which will improve the technical infrastructure of Greece.

The Technical Chamber of Greece is the official organisation to certify that A.C.E.G. is the only association to represent civil engineers all over Greece. Subscription to the Technical Chamber in Greece is obligatory by law.

Address and contact details:

The Association of Civil Engineers of Greece (ACEG)

Address: 89 Kallirois Street, 11745 Athens, Greece

Phone: (+30) 210923 8170

Fax: (+30) 2109238800

E-mail: spme@tee.gr

Internet: www.spme.gr

HUNGARY (HU)

The Hungarian Chamber of Engineers (Magyar Mérnöki Kamara)/(HCE)

The Hungarian Chamber of Engineers conducts and certifies the qualification of professional engineers. The Hungarian Association of Engineers was formed in 1866. It did not function during the communist era. The Hungarian Chamber of Engineers (HCE) was re-formed in 1989 and it became a public organisation in 1996, when the Hungarian Parliament approved the "Act of Designing and Expert Engineers and Architects".

An engineering diploma and engineering practice (MSc degree + minimum two years' practice or BSc degree + minimum five years practice) is needed for the membership of the HCE. The authorisation to design or to be an expert has additional conditions: a required quantity of engineering subjects in the curriculum and a report on the candidate's training and experience. The HCE has 19 professional branches (e.g. building, structural, protection of environment, geotechnics, electrical, water management, installation, etc.).

Every branch has a Qualification Committee. These committees control the candidate's report and the candidate's diploma and on the basis of the diploma and practice they may give the authorisation to the applied field.

Every year the HCE publishes a "Register Book of Authorised Designers and Experts". This book is sent to professional offices, councils, larger enterprises and to the members of HCE.

In Hungary a designer's entitlement is required for persons intending to perform engineering-designing activities subject to a permit, and a special expert's entitlement is required before an expert opinion, or advice can be given.

Granting membership and establishing entitlement of non-Hungarian citizen engineers is administered by the Chamber under a single procedure. Entitlement-establishment in Hungary of citizens of the European Economic Region (EER comprises the European Union plus Norway, Iceland, Liechtenstein) is administered in part by the Chamber, in part by the competent ministry. On the basis of the documents presented to the Chamber by the applicant EGT-citizen engineer, the Chamber, acts on his/her behalf and submits the application to the ministry. The Chamber relies upon the results given by the ministry, and decides upon the entitlement.

The criteria for entitlement (qualification, academic degree: MSc or BSc, further the prescribed number of years of designing practice) according to which HCE grants Category "A", or Category "B" entitlement are set out in the Order on the detailed rules of entitlement.

The criteria for obtaining entitlement are as follows:

- Membership of the Hungarian Chamber of Engineers (HCE) with paid membership fee
- "Entitlement Licence" issued (on application) by the HCE and on the basis thereof entry into the Chamber's official "Register of Designers and Experts".

Designers' categories and the relevant entitlements:

Designers in a specific area are classified into two categories, depending on their qualification and expertise:

- Designer Category “A” (also called “leading designer”) is entitled to perform any designing activity in his specific area.
- Designer Category “B” (also called “designer”) is entitled to design projects listed in the order which sets out the detailed rules of entitlement. Designers of a lower level of qualification are allowed to design on their own responsibility simpler projects which present a lower risk only.

Address and contact details:

Hungarian Chamber of Engineers (HCE) (Magyar Mérnöki Kamara)

Address: Angyal u. 1-3, 1094 Budapest, Hungary

Phone: (+36) 1 455 7083

Fax: (+36) 1 455 7089

E-mail: rm@mmk.hu

Internet: www.mmk.hu

IRELAND (IE)

Institution of Engineers of Ireland (IEI)

The Institution of Engineers of Ireland, was founded on 6th August 1835. The Institution, which is the second oldest engineering institution in the English speaking world received its charter in 1877 and thus became one of the first chartered professional bodies in these islands. In its current form it represents a merger of the original "Institution of Civil Engineers of Ireland" with the *Cumann na nInnealtóirí* (The Engineers Association) which had been founded in 1928 as an independent body whose declared functions were "the economic advancement of engineers, their participation in social, economic and national affairs, the promotion of the professions' work, and conscious awareness of its influence in the community." In 1969, the two associations merged when the Institution of Civil Engineers of Ireland (Charter Amendment) Act was passed by the *Oireachtas*, the National Parliament of the Republic of Ireland. It thus widened its scope to cater for changing circumstances and emerging developments in technology and society.

The Institution of Engineers of Ireland is the largest professional body in Ireland and currently represents over 22,000 Engineers and Technicians - over 3,500 of whom are student members. The Institution of Engineers of Ireland (IEI) promotes the art and science of engineering in Ireland and is the representative voice of the engineering profession in Ireland, encompassing all disciplines of engineering.

The Institution organises a comprehensive national and regional programme of papers, lectures, talks, discussions, seminars, conferences, courses, site visits and social activities to enable members to keep up to date with all aspects of their profession and to do so in a congenial social atmosphere.

The Institution plays a significant role in promoting the interests of the engineering profession and the well being of the economy through:

- Ensuring proper standards within the profession through accreditation of third level qualifications, appropriate memberships review procedures and a code of ethics.
- The promotion of engineering as a career
- The promotion of continuing Professional Development for engineers
- The preparation of submissions to Government and to Government Bodies on issues of concern or interest to the engineering profession
- Representation of the interests of the Irish engineering profession internationally.

Address and contact details:

The Institution of Engineers of Ireland (IEI)

Address: 22 Clyde Road Ballsbridge, Dublin 4, Ireland

Phone: (+353) 1.668 4341

Fax: (+353) 1 668 5508

E-mail: iei@iei.ie

Internet: www.iei.ie

ITALY (IT)

Consiglio Nazionale Degli Ingegneri (CNI)

The Consiglio does not have individual members. Engineers may enroll in the *Albo* (Register) of the *Ordine Provinciale* (which operate at the provincial level). Both the Consiglio and the Ordine Provinciale are involved in the continuing professional development of engineers. The Consiglio has 103 Ordini Provinciale located in each provincial capital in Italy. These Ordini maintain the Register (Albo). Enrolment in such a register is obligatory to practice the regulated activities. Each Ordine Provinciale is a legal entity according to Public Law. A detailed description of the role of the Ordine, as set out by legal Decree, appears in Chapter 7 of this publication.

The Ordine run continuing professional development courses, organise cultural-technical events and issue magazines or regular information to ensure members are informed and able to participate actively in the organisation. Many Ordini make information freely available through their own internet sites.

There are no associated societies.

The Consiglio Nazionale is a body set up by public law for the purpose of overseeing the organisation of the engineering sector at national level. It operates under the jurisdiction of the Ministero della Giustizia (Ministry of Justice).

The Consiglio of CNI is formed by eleven Councillors elected every three years. With regard to the legal establishment of the Consiglio Nazionale degli Ingegneri, please refer to Chapter 7 of this publication for further details.

Address and contact details:

Consiglio Nazionale degli Ingegneri (CNI)

Address: Via Quattro Novembre 114, 00187 Rome – Italy.

Phone: (+39) 06 697 6701

Fax: (+39) 06 697 67 050

E-mail: esteri@cni-online.it

Internet: www.tuttoingegnere.it

LATVIA (LV)

The

Latvia Association of Civil Engineers (Lat ACE)

Latvijas Būvzinieru savienība – (LBS)

and

Latvia Society of Heat, Gas and Water Technology Engineers

are the two separate non-governmental Associations in Latvia dealing with Civil Engineering and Environmental matters.

The number of members in the organisation (Lat ACE) is around 630, the number of associated members around 37.

Form of legal establishment: Non-governmental voluntary organisation, acting in accordance with Latvian legislation and Statutes, registered in State Enterprises Register in 1993, reg. Nr. 000800022 (LBS).

Latvia ACE associates only individuals, not organisations or societies. For connections with different ministries, associations etc. members are appointed from the Board of Association.

The main goals of Lat ACE are:

- to unite different civil engineers for common creative work;
- to maintain high professional standards of its members;
- to protect the public interests of civil engineers;
- to assess engineers' qualification through a certification procedure;
- to discuss and disseminate technical standards and achievements of science;
- to promote continuing professional development and lifelong learning;
- to promote the ethical development of its members
- to influence government, civil engineering industry and public debate.

Address and contact details.

Latvia Association of Civil Engineers (Lat ACE)

Address: K. Barona str. 99, Riga LV1012, Latvia

Phone: +371 7845910

Fax: +371 7845910

E-mail: lbs@apollo.lv

Internet: www.lbs.building.lv

or:

Phone: +371 7089287

E-mail: juris.naudzuns@inzenierbuve.lv

LITHUANIA (LT)

Lithuanian Association of Civil Engineers (LSIS)

Lithuanian Association of Civil Engineers (LSIS - Lietuvos statybos inžinierių sąjunga).

The number of members in the organisation is around 900.

Form of legal establishment: The Lithuanian Association of Civil Engineers was established in September 1989. Officially the Association was registered in the Council of Ministers of Lithuania on 5th of March 1990. Document No 57.

LSIS was one of the first professional organisations, which started activities after re-establishment of Lithuanian independence.

The main goals of the Lithuanian Section of ECCE are:

- to maintain high professional standards of its members;
- to disseminate technical standards and achievements of science;
- to promote continuing professional development and lifelong learning;
- to influence government, civil engineering industry and public debate;
- to represent the civil engineering community within ECCE;
- to protect public interests in civil engineering.

At the present LSIS does not have associated societies. Other societies in the construction sector act autonomously.

Address and contact details:

Lithuanian Association of Civil Engineers (LSIS)

Address: Kalvarijų str. 1, LT 09310 Vilnius-5, Lithuania

or

Civil Engineering Department,

Address: Saulėtekio al. 11, 10223 Vilnius, Lithuania

Phone: +3702745220

Fax: +3702745222

E-mail: vincentas.stragys@st.vtu.lt

Internet: <http://www.lsis.lt>

POLAND (PL)

Polish Association of Civil Engineers and Technicians (PZITB)

PZITB stands for 'Polski Związek Inżynierów i Techników Budownictwa', the Polish Association of Civil Engineers and Technicians.

The Association was officially registered in 1934.

Representing six associations and one chamber acting in the field of civil engineering and design, on the basis of an agreement of 26th January 2001, the Polish Group of ECCE comprises:

- (1) Polish Association of Civil Engineers and Technicians
- (2) Polish Association of Transport Engineers and Technicians
- (3) Association of Bridge Engineers of Poland
- (4) Polish Association of Sanitary Engineers and Technicians
- (5) Polish Association of Water Engineers and Technicians
- (6) Polish Association of Electric Engineers and
- (7) Polish Chamber of Civil Engineers

There are approximately 6,000 members in the organisation PZITB; 15,000 members in all six associations acting in the field of civil engineering; 102,000 members in the Polish Chamber of Civil Engineers.

Its legal basis may be termed an 'Association of higher public usefulness', which could roughly be translated as an association for the public good.

At present there are no associated societies.

PZITB is the official organisation certifying eligibility as the body to represent civil engineers.

Address and contact details:

Polish Association of Civil Engineers and Technicians (PZITB)

Address: 00-050 Warsaw, 14 Świętokrzyska Street, Poland

Phone: (48 22) 826-86-34

Fax: (48 22) 826-86-34

E-mail: zgpzitb@it.com.pl

Internet: <http://www.zgpzibt.org.pl>

PORTUGAL (PT)

Ordem dos Engenheiros (OE)

The Ordem dos Engenheiros (OE) is the professional association of all Portuguese engineers. It has 31,700 members. It is the successor of the Association of Civil Engineers which had been founded in 1869. Legally it is a not-for-profit association.

The members are those who have obtained an engineering degree in a five-year university course that has been approved by OE. The OE also gives other qualification titles (senior, specialist, etc.) to its members, according to their experience. Awarding these titles is performed by internal technical groups of OE.

The organisation of the Ordem dos Engenheiros comprises a national council and several regional representations including the islands of Madeira and Azores.

The OE is also divided into colleges according to the engineers' specialisation. The Civil Engineering College represents around 40% of the total members of OE. The participation of OE in the ECCE is performed by the Civil Engineering college.

The activities of OE include the evaluation of the university courses, activity in preparation of legislation related to engineering, organisation of scientific and cultural activities, consultant activities related to professional and technical problems, etc.

The OE has also a department (Caixa de Previdência) to provide social and medical help to its members.

The Civil Engineers activities in Portugal are connected with the Ministers of Public Works, Housing and Environment.

Address and contact details:

Ordem dos Engenheiros (OE)

Address: Av. Sidonio Pais 4 E, PT-1050 – 212 Lisboa, Portugal

Phone: (+ 351) 21.313.2600

Fax: (+ 351) 21.352 4632)

E-mail: colegios@cdn.ordeng.pt

Internet: www.ordeng.pt

ROMANIA (RO)

The Romanian Union of Civil Engineers Associations (UAICR)

The Romanian Union of Civil Engineers Associations (UAICR) was established in December 1995, although the first Association of Romanian Engineers was founded in 1895. The first association of Romanian Engineers was a Polytechnic Society whose members were principally civil engineers, graduates of the National School for Roads and Bridges of Bucharest or from foreign universities, in particular the Ecole Nationale des Ponts et Chaussées in Paris.

The present Union has around 10,000 members. The UAICR is a professional, non-governmental, apolitical, non-profit organisation which acts as an umbrella organisation for a large number of different associations in the country. This currently groups 11 associations and societies:

- The Association of Civil Engineers of Romania
- The Association of Structural Engineers of Romania
- The Civil Engineering Society of Romania
- The Romanian Concrete Society
- The Romanian Society of Soil Mechanics and Geotechnical Engineering
- The Society of Construction Engineering and Management
- The Romanian Association for Earthquake Engineering
- The Association of Technical Experts in Construction
- The Romanian Association of Tunnelling
- The National Commission for in Situ Behaviour of Constructions

Address and contact details:

Romanian Union of Civil Engineers Associations (UAICR)

Address: Bul. Lacul Tei 124, Bucharest, 020396, Romania

Phone: (+40) 21 242 96 17

Fax: (+40) 21 242 96 17

E-mail: manoliu@mail.utcb.ro

Internet:

RUSSIA (RU)

Russian Society of Civil Engineers (ROIS)

The Association of Construction Engineers of Russia (ROIS) was formed in January 1993, under the initiative of a group of leading engineers, architects, scientists, heads of organisations and enterprises.

ROIS considers that its activities are based on the best traditions of the Russian Society of Civil Engineers which was formed in 1866.

ROIS is an independent public association with individual membership. Membership includes well-known and respected engineers, scientists, technical officers, heads of state control bodies and large public organisations – not only in capital construction but in allied industries and associated market infrastructure.

Over the period of its existence ROIS members have developed over 30 normative and legislative drafts in the sphere of investment and building. ROIS representatives are included in the expert commission of the State Duma. ROIS is also an active member of the Council of public associations and professional organisations, which have signed the contract on interaction in the investment and building spheres.

Address and contact details:

The Russian Society of Civil Engineers (ROIS)

Address: ul. Novy Arbat, 11, 121 822 Moscow, Russia

Phone: (+7) (095) 202 32 15

Fax: (+7) (095) 202 82 90

E-mail: pois_edo@mtu-net.ru

Internet: under developing

SLOVAK REPUBLIC (SK)

Slovak Chamber of Civil Engineers (SKSI) – Slovenská komora stavebných inžinierov

The Slovak Chamber of Civil Engineers (Slovenská komora stavebných inžinierov - SKSI) is a self-governing professional organisation established by the Act of the Slovak National Council No. 138/1992 Coll. on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations.

In 1913, the Chamber of Civil and Mining Engineers was established by law in cooperation with other organisations of the Austrian-Hungarian Monarchy. After the establishment of the independent Czechoslovak Republic, the Engineering Chamber of Czechoslovakia was founded on 13th March 1920.

The Civil Engineering Chamber was dissolved in 1951. It was renewed 41 years later in 1992 by the above-mentioned Act No. 138/1992 Coll.

The main tasks of the Chamber include:

- participation in the protection of public interest in the sphere of building and protection of the rights of the individual members of our chamber;
- supporting the international exchange of members and contributing to the development of the building and construction industry;
- safeguarding international exchange of professional knowledge with scientific institutions;
- defending and supporting engineers' rights and professional interests, and supporting the professional credit between engineers;
- ensuring that civil engineers practice their profession in a professional manner, in compliance with ethics in the manner established by the relevant national acts and directives as well as by the regulations of the chamber.

Our membership comprises authorised engineers, voluntary members, legal persons and visiting foreign members.

In accordance with the law, the Chamber issues certificates for authorised engineers to carry out complex architectural and engineering services and related technical advisory responsibilities which includes professional activities in building construction and civil engineering. Consultancy design, static analysis as well as technical, technological and energy-related equipping of buildings are included in this definition of professional activities. Furthermore, authorised engineers may provide technical and economic consultancy services, expert opinions and professional author's supervision of building in accordance with the design documentation. The certificates are issued after passing the relevant examination before the Board of Examiners of the Chamber. There are more than 4,400 authorised engineers in Slovakia.

The Chamber also provides professional education for building site managers and building invigilation officers. They also receive diplomas, after passing the Chamber's examination. Since 1996, the Chamber has issued 9,900 certificates for building site managers. It has issued more than 8,600 certificates for building invigilation officers in Slovakia in the last seven years.

The Chamber has the following structure: the General Assembly, the Board, the Supervisory Board, the Executive Board and the President.

Other elected organs are: the Authorisation Commission, the Committee for Foreign Affairs, the Ethical Council and the Disciplinary Board.

The seat of the Chamber is in Bratislava. Regional offices are located in Bratislava, Trnava, Žilina, Banská Bystrica and Košice.

The Chamber cooperates with many organisations, syndicates and associations in the field of the building and construction industry. The cooperation with the civil engineering faculties of the technical universities in Slovakia is based on mutual agreements. The Chamber cooperates with ministries and other state administration bodies, especially in the area of creation of legislation regarding the building sector. The Chamber initiates organising the professional events, mainly in the area of lifelong education for its members. It provides financial support for publishing professional literature. The chamber itself is a publisher of the newsletter for authorised engineers "Inžinierske informácie" ("Engineering Information") and the magazine "Projekt - stavba" ("Design - Construction").

The Chamber actively cooperates with foreign civil engineering chambers and associations and has signed cooperation agreements with the Czech, Hungarian, Bavarian, Saxon and other European chambers. The Slovak Chamber is a member of the European Council of Civil Engineers (ECCE) and is a founding member of the European Council of Engineering Chambers (ECEC).

In the course of the year 2003, the activities of the Chamber were concentrated on the accession process of Slovakia into the European Union, especially in the area of recognition of professional qualifications in accordance with the EU directives; in the area of harmonisation of the Slovak standards in connection to the further development of Eurocodes and related activities.

Government departments in Slovakia responsible for civil engineering matters:

- *The Ministry of Reconstruction and Regional Development of the Slovak Republic*
 - The Construction Section
 - The Apartment Policy Section
 - The Section of Territorial Planning and the Construction Code
- *The Slovak Building Supervision Office*
- *County Construction Offices (Specialised Local Authorities)*
- *The State Housing Development Fund*
- *The Ministry of Environment of the Slovak Republic*
 - The Department of the Assessment of Impacts on the Environment
 - The Waters Section
 - The Nature Preservation and Landscape Conservation Section
 - The Section for the Protective Components of the Environment
- *The Ministry of Economy of the Slovak Republic*
 - The Production and Network Industries Section
- *The Ministry of Transport, Posts and Telecommunications of the Slovak Republic*
 - The Road Transport Section
 - The Road Infrastructure Section
- *The Ministry of Defence of the Slovak Republic*
 - The Modernization and Infrastructure Section
- *The Ministry of Interior of the Slovak Republic*
 - The Department of Labour Inspection and Construction Supervision

Address and contact details:

The Slovak Chamber of Civil Engineers (SKSI)

Address: Mýtňa 29, P.O.Box 10, 810 05 Bratislava, Slovakia

Phone: ++421-2-52 495 042

Fax: ++421-2-52 444 093

E-mail: sksi@nextra.sk

Internet: www.skisi.sk

SLOVENIA (SI)

The Slovenian Chamber of Engineers (IZS) – Inženirska Zbornica Slovenije

Organisation:

Slovenian Chamber of Engineers (IZS) is the umbrella association for more than 5,500 authorised engineers. It consists of six professional Sections as follows:

MSG – Section of civil engineers (2,255 members);
MSE – Section of electrical engineers (1,485 members);
MSS – Section of mechanical engineers (1,210 members);
MST – Section of engineers of technology and other engineers (220 members);
MSGeo – Section of land surveyors (220 members);
MSR – Section of mining and geotechnical engineers (110 members).

Milestones

Foundation date: 21st November 1996

Policy overview

Main areas of activity:

1. ensuring the provision of professional examinations (in order to be responsible for project design, works management, auditing and to be authorised land surveyors)
2. administering a register of authorised engineers
3. promoting and organising further professional training
4. informing members
5. setting out professional principles (good practice)
6. conducting supervision of the observation of the IZS code of professional ethics
7. international cooperation

IZS performs the activities specified in points 1 and 2 as a public authorisation pursuant to the provisions of the Construction Act and provisions of the Legal Act governing the performance of land surveying activities.

Registers of authorised engineers:

Individuals entered in the registers as:

- responsible project designers,
- responsible auditors,
- responsible work managers,
- responsible land surveyors.

Holding of Professional Examinations

Types of professional examinations:

- Basic
- Supplementary

Basic professional examinations:

- The examination for responsible project design
- The examination for responsible works management

Supplementary professional examinations:

- The examination for responsible project design
- The examination for responsible auditing
- The examination for responsible works management

Standards of knowledge, the programmes for professional examinations and the manner in which they are held are prescribed by the Minister responsible for planning and construction matters.

Main documents

- Slovenian Construction Act
- Slovenian law governing the performance of land surveying activities
- Statute and other chamber acts
- Electronic register of authorised engineers
- Minimum tariff conditions for performing activities of construction project design and other project design, the provision of land surveying services and the auditing of construction and other plans.

To aid your understanding of our responses, please note that the following abbreviations are used in our responses throughout this publication:

- IZS – Slovenian Chamber of Engineers
- MSG – Section of Civil Engineers
- ZGO - Construction Act

Address and contact details for the IZS – MSG:
Slovenian Chamber of Engineers (Inženirska zbornica Slovenije) (IZS)
Section of Civil Engineers (Sekcija gradbenih inženirjev)
Address: Jarška cesta 10 b, 1000 Ljubljana
Phone: +386-1-547 33 40 **Fax:** +386-1-547 33 20
E-mail: izs@izs.si **Internet:** www.izs.si

SPAIN (E)

Colegio de Ingenieros de Caminos, Canales y Puertos (CICCP)

In Spain the profession of civil engineering – the equivalent of the title in Spanish is: engineer of roads, channels and ports – is linked, from its very birth, to the name of Agustín de Betancourt, the founder of the faculty of Civil Engineering dating as far back as 1802 the foundation of the first Escuela de Ingenieros de Caminos (Faculty of Civil Engineering), in Madrid. Currently, there are 9 civil engineering faculties all over Spain.

The Colegio de Ingenieros de Caminos, Canales y Puertos (the official body) was founded in 1953 as a corporation of public interest and a legal entity in its own right. The main purposes of the Colegio are to regulate the practice of civil engineering, to be the exclusive representative of the profession of the Spanish Civil Engineers both national and internationally; to cooperate with the Public Administration, to arbitrate professional disputes and to defend the professional interests of civil engineers.

The Colegio de Ingenieros de Caminos, Canales y Puertos acts towards a higher level of employment for its professionals, helps young graduates to find their first job, as well as see to a continuous professional development through courses organised by the Colegio.

In Spain it is compulsory to be a member of the Colegio in order to practice as a professional civil engineer. All those professionals who hold the officially acknowledged degree as a civil engineer have the right to request membership from the Board of Directors of the Colegio.

Applicants from the EU as well as from third countries, are required to obtain prior recognition of their civil engineering degree from the Ministry of Public Works or the official approval of the Ministry of Education before becoming a member of the Colegio.

Number of members in the organisation:

Currently the Colegio has some 19,000 members.

Form of establishment:

The statutes by which the Colegio is ruled, were modified in 1979 and new statutes were approved in October 2003 and are legally based in the “*Ley de Colegios Profesionales 2/1974*” (Law on Professional Bodies of 1974).

The Colegio is a single body, with its head office in Madrid and 19 autonomous offices (‘demarcaciones’) all over Spain with their own operational rules. Each member of the Colegio belongs to a specific autonomous office, according to his/her home address.

The General Council is the supervising body and assesses the Board of Directors which is the executive managing and administrative body of the Colegio.

Among the many activities embraced by the Colegio, we highlight the following:

Certification (‘Visado’)

This is a process by means of which the Colegio certifies the authenticity of the author of a project (signed by a civil engineer member of the Colegio). Furthermore it certifies certain details of the project. In the event that a client does not pay a member for his project, the Colegio may initiate the legal process against the client in the name of the member. This mandatory certification process is the responsibility of the autonomous offices which charge an amount of money for doing so.

Other services offered by the Colegio to its members include Employment Service; International Relations; Service for Retired Engineers; Research and Library; Book Store; PR; Data Processing – in 2004 this department received the EEMA Award for Excellence in Secure Electronic Business for a digital signature solution to smooth the process and reduce paperwork for the members in the certification process.

Other institutions linked to the Colegio but with a different legal entity are a financial institution and an insurance company.

Associated societies: Foro del Agua and Foro de Infraestructuras, Water and Infrastructure Forum, and the Asociación de Ingenieros de Caminos, Canales y Puertos.

Address and contact details:

Colegio de Ingenieros de Caminos, Canales y Puertos (CICCP)

Address: Almagro 42, 28010 Madrid, Spain

Phone: (+34) 91 308 19 88

Fax: (+34) 91.319 15 31

E-mail: 17jdb@ciccp.es or 17amd@ciccp.es **Internet:** www.ciccp.es

TURKEY (TR)

Turkish Chamber of Civil Engineers (TCCE) (İnşaat Mühendisleri Odası - İMO)

The Turkish Chamber of Civil Engineers (TCCE) is the widest technical organisation in Turkey, with over 64,000 members, 26 branches and 135 representation offices. TCCE was founded by law, in 1954, under the umbrella of the Union of Chamber of Turkish Engineers and Architects (UCTEA).

Since 19th December 1954, the week of foundation has traditionally been accepted as National Civil Engineering Week. By investigations (surveys, etc.) and activities, TCCE has sought to provide the best evaluation of national resources for the benefit of the country. It has supported and formed any necessary public arrangements in the idea of a more civilized nation; it has opposed and debated attempts that are against the national will and has always fulfilled the responsibility of the engineering concept in sustainability and consistency.

Every civil engineer who has graduated from a civil engineering department of a university in Turkey is obliged to be a member of TCCE for private sector engineering. Being a member of TCCE is discretionary for public sector engineers. Within this framework, TCCE has 64,000 members out of the current total of 80,000 Turkish civil engineers. This provides consistency in civil engineering within Turkey, and forms a strong organisation of professional standards. One of the principles of TCCE is to protect and maintain the rights of colleagues whenever the situation requires.

TCCE actively participates in the planning and preparation of laws, legal arrangements, and rules about civil engineering; working with both public and academic areas to achieve this. It proposes upgrading the legality of applications in civil engineering, taking into consideration benefits both to the public and the country. TCCE controls the validity of civil engineering projects and the application of legal treatments in order to protect labour rights and workers' health and safety regulations. The TCCE maintains production of appropriate materials in specific standards and provides the quality management of material application in Turkey; carries out studies on city planning features and problems of the country in consideration of regional social and economic structures and improvement in structural typologies. It researches civil engineering developments and presents professional advances both to the public and to colleagues.

One of the essential roles of TCCE is being an effective body for earthquake-related studies, regulations and technical-academic-social aspects. TCCE participates actively in 'before and after' crisis situations, legislation studies on structural issues relating to earthquakes, relationships with governmental and non-governmental organisations. The Chamber has presented quite essential support during the aftermath of disasters, providing human, logistic and moral assistance, as well as technical and academic research specialists, mobilisation supports and official reports on earthquake observations. Earthquake engineering studies are included in the Chamber's professional development programmes and courses, covering a wide range from design to damage determination. These have contributed greatly to general earthquake studies of the country.

Through such activities and Chamber publications, TCCE has improved professional education and raised consciousness of progress across the sector. We are willing to widen this perspective to an international basis: we maintain strong relations with chambers or societies from other countries to support acceleration and correlation in civil engineering media.

Within the framework of relations with other organisations, membership of TCCE in the European Council of Civil Engineers (ECCE), is an essential international relationship for the chamber. As a gathering of member organisations whose aim is to have a common perspective throughout Europe's civil engineering profession, ECCE has been influencing profession-related studies and representing a common view of civil engineers in Europe. With the initiative of advancing the built environment by protecting the best of the natural environment, TCCE expresses interest in a wide range of areas and maintains an ongoing cooperation between involved bodies within the framework of ECCE.

Advances in issues covering environment, research and development, education and training, ethics, information technology, continuing professional development, liability and transportation, are the aims of TCCE and its fellow member organisations in ECCE. In order to achieve these goals, the Chamber organises many activities such as workshops, conferences, periodic meetings and, most importantly, task forces for rapid and productive progress. In parallel to these goals, member organisations and countries are informed about both national and international activities via ECCE documentation, and encouraged to keep up with the latest events and advances, as well as the recent decisions to have best possible functions.

The achievements in progress and advances resulting from common studies in ECCE, provide the best endorsement for the civil engineering profession in Europe and related countries. In particular, the relationship between ECCE and the Turkish Chamber of Civil Engineers, TCCE, has been enduring with successful accomplishments for both sides, as Turkey figures as an important region for civil engineering, and has been developing close relations with Europe.

Number of active members in the organisation

61,626 members were registered with TCCE at 7th July, 2004.

Form of legal establishment: Established in accordance with legal requirements. TCCE was founded by law, in 1954, under the umbrella of the Union of Chamber of Turkish Engineers and Architects (UCTEA) by law no. 6235-7303. Legislation can be accessed via Ministry of Justice, web site (www.adalet.gov.tr).

Associated societies: There are no associate societies: TCCE is one of the engineer and architect organisations under UCTEA. Therefore, TCCE is related to the other 22 chambers of engineering disciplines and architects, based on a common legal definition.

The Government body certifying eligibility to represent civil engineers: The Ministry of Justice whose address is: Adalet Bakanligi 06659 Kizilay Ankara.

Internet: www.adalet.gov.tr Email: info@adalet.gov.tr

As mentioned above, the Regulation for UCTEA and chamber formations was accepted and legalised by the Turkish government in 1954.

Address and contact details.

The Turkish Chamber of Civil Engineers (TCCE) - (*İnşaat Mühendisleri Odası - İMO*)

Address: Selanik Cad. 19/1 Kizilay, Ankara, Turkey

Phone: (+90) 312 4193882

Fax: (+90) 312 4170632

E-mail: imo@imo.org.tr

Internet: www.imo.org.tr

UNITED KINGDOM (UK)

Institution of Civil Engineers (ICE)

The Institution of Civil Engineers (ICE) is the world's oldest engineering institution. It was established in 1818 and granted a Royal Charter in 1828. Its first President was Thomas Telford. Today ICE represents over 70,000 professionally qualified engineers worldwide.

ICE is an independent, non-political organisation registered as a charity in the United Kingdom. By the Royal Charter, ICE is granted the right to award the title "Member of the Institution of Civil Engineers". Furthermore, as one of the member organisations of the Engineering Council (UK), ICE is licensed to award the protected titles Chartered Engineer, Incorporated Engineer and Engineering Technician.

While the majority of members live in the United Kingdom, ICE has an expanding international membership – about one fifth of the members live outside the UK. There are ICE members in 145 countries around the world.

ICE's strategy is to be a leader in shaping the engineering profession. It aims to do this by:

- delivering products and services that are attractive, relevant & valued by members and employers globally,
- raising the profile of civil engineers,
- maintaining high professional standards,
- providing an international source of skills and knowledge for tomorrow's engineering,
- being broad and inclusive of all those engaged in civil engineering,
- influencing governments, industry and public debate,
- partnering with relevant bodies.

Membership

ICE offers different grades of membership:

- Student
- Graduate
- Technician
- Member
- Fellow

Membership at each level is granted to those who fulfil the established criteria for each category. Full membership, which gives the right to use the designatory letters "CEng MICE", requires the following:

- The achievement of the required educational base. This will normally be either:
 - an undergraduate MEng programme accredited for CEng or
 - an undergraduate BEng(Hons) programme accredited for CEng plus either an appropriate Masters degree accredited or approved, or appropriate Further Learning to Masters Level.
- A period of responsible work experience under early guidance and decreasing supervision, known as Initial Professional Development. The period considered adequate in order to obtain the range of structured training and depth of responsible experience necessary for a Professional Review is usually deemed to be at least four years.

- Success at the Chartered Professional Review (CPR). The CPR consists of the submission of an application for membership including the following documents:

completed questionnaires from four sponsors who are members of ICE, an experience report, a project report, a record of achievement of core and specific objectives, a development action plan and personal development record. Then follows a presentation and an interview with two Reviewers and a written assignment under examination conditions.

Organisation

The Council is the governing body of the Institution. It is led by the President, and comprises members of all classes who represent the membership both within the UK and worldwide. Members of the Council are elected by the membership each year, and normally serve for a period of three years.

The President is elected annually by the Council, and is a leading Civil Engineer in the consulting, contracting or academic field. The President is the 'public face' of the profession, and champions the interests of civil engineers, in particular in dealings with Parliament, Government, and the media.

The Director General is responsible for the day-to-day operation of the Institution. Directors are responsible for areas covering Engineering Knowledge, Membership, Communications, Commercial Services and Finance and Resources. The Secretariat is located in Westminster, London, but ICE also has regional offices throughout the UK.

International

More than a fifth of the membership of ICE is living and working outside the UK. ICE has offices in Hong Kong, China and Russia. Ninety-five Country Representatives, who are Members of ICE, represent the Institution worldwide on a voluntary basis.

ICE is also a member of several international bodies, such as the European Council of Civil Engineers (ECCE), the World Federation of Engineering Organisations (WFEO), the Commonwealth Engineers' Council (CEC) and the European Society for Engineering Education (SEFI). Through the Engineering Council (UK), ICE is party to the Washington Accord (which provides a mechanism for mutual recognition of accredited education at Chartered Engineer level), the Sidney Accord (which provides joint recognition of academic programmes accredited at Incorporated Engineer level), and the Dublin Accord (which underpin the granting of Engineering Technician titles). The Engineering Council (UK) also represents all British engineering institutions in the European Federation of National Engineering Institutions (FEANI) and the Engineers' Mobility Forum (EMF).

ICE has established co-operation agreements with engineering institutions of various other countries around the world, and has entered into Mutual Exemption Agreements with some of them to facilitate reciprocal membership.

ICE plays an active role internationally with regard to sustainable development and poverty alleviation, and also engages closely with the European Union.

Associated societies:

ICE's Associated Societies are crucial to the Institution's "learned society" function, contributing to the knowledge base across a wide range of specialist areas within the diverse arena of the built and natural environment. ICE has the following Associated Societies:

The British Dam Society (BDS)
The British Geotechnical Association (BGA)
The British Hydrological Society (BHS)
The British Nuclear Energy Society (BNES)
The British Tunnelling Society (BTS)

Central Dredging Association (CEDA)
International Association of Hydraulic Engineering and Research (IAHR)
The International Commission on Irrigation and Drainage (ICID)
The Offshore Engineering Society (OES)
International Navigation Association (PIANC)
The Railway Civil Engineers' Association (RCEA)
The Society for Earthquake and Civil Engineering Dynamics (SECED)
Transport Planning Society (TPS)
The United Kingdom Society for Trenchless Technology (UKSTT)
Wind Engineering Society (WES)

Government departments in the UK responsible for civil engineering and construction matters:

Several Government departments and Ministries are involved to some extent in civil engineering and construction matters. The main government partner for the construction industry is **the Department for Trade and Industry (DTI)**, which has a Construction Sector Unit. A Parliamentary Under-Secretary of State, currently Nigel Griffith MP, is Minister for Construction, Small Business and Enterprise. DTI is also the government department responsible for energy.

The **Office of the Deputy Prime Minister (ODPM)** is responsible for Building Regulations, housing policy, land planning and urban policy.

The Department for Environment, Food and Rural Affairs (Defra) engages with civil engineering related to the environment and rural affairs and the pursuit of sustainable development.

Civil engineering is also an important aspect of the work of **the Department for Transport (DfT)**, which is responsible for all aspects of transport policy.

The Department for Education and Skills (DfES), being responsible for higher education, is relevant for issues concerning the education of engineers.

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**ECCE HAS SIGNED AGREEMENTS WITH
THE AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
AND THE JAPAN SOCIETY OF CIVIL ENGINEERS (JSCE)**

United States of America (US)

American Society of Civil Engineers (ASCE)

The American Society of Civil Engineers has taken an active role in the development of the American nation since 1852.

ASCE members come from all disciplines of civil engineering, from all types of environments, and from all over the world. ASCE has sections outside of the United States in Bangladesh, Colombia, Egypt, Hong Kong, India, Indonesia, Japan, Mexico, Panama, Puerto Rico, Saudi Arabia, Thailand and the United Arab Emirates.

ASCE took a large step in 2003 to raise the bar for the civil engineering profession. Building on years of investigation and discussion, the Task Committee on Academic Prerequisites for Professional Practice drafted the Civil Engineering Body of Knowledge outlining and expanding on the information, skills, and attitudes future professional civil engineers will need to master. The final report redefines educational requirements and sets new standards for continuing professional development. Ultimately, the Body of Knowledge (BOK) will raise the value and status of a civil engineer in our global society.

Address and contact details:

American Society of Civil Engineers (ASCE)

Address: 1801 Alexander Bell Drive, Reston, Virginia, 20191-4400, U.S.A.

Phone: (703) 295-6300

Fax: (703) 295-6222

E-mail: <http://www.asce.org/contact.cfm>

Internet: www.asce.org

Japan (JP)

Japan Society of Civil Engineers (JSCE)

The Japan Society of Civil Engineers (JSCE) was established in 1914 under the mission to contribute to the advancement of science and the development of the society through the promotion of the civil engineering field.

It functions currently under three main pillars of activities:

- contribution to the advancement of academic and technical fields
- direct contribution to the general public and the society and
- the promotion of information exchange.

JSCE currently has 40,000 members consisting of contractors and consultants. These amount to 50% of the membership, followed by government-sector employees who comprise approximately 20%, and educational sectors such as universities and research institutions making up 15% of the membership.

Headquartered in Tokyo, JSCE operates through eight regional chapters as well as three overseas chapters in Korea, Taiwan, and the U.K. In terms of international activities, JSCE has so far concluded cooperation agreements with 23 overseas civil engineering societies and institutions, one of which is ECCE.

Address and contact details:

Japan Society of Civil Engineers (JSCE)

Address: Yotsuya 1-chome, Shinjuku-ku, Tokyo, 160-0004, Japan

Phone: (+81)-3-3355-3452

Fax: (+81)-3-5379-2769

E-mail: iad@jsce.or.jp

Internet: <http://www.jsce.or.jp>

Contacts with other Pan-European/International Organisations:

- WFEO/
FMOI** **World Federation of Engineering Organisation/
Fédération Mondiale des Organisations d'Ingénieurs**
Ms. Françoise Côme, Executive Director
Maison de l'UNESCO, 1 rue Miollis, F-7532 Cedex 15, France
Phone: (+33) (0)1. 45 68 48 46/47 Fax: (+33) (0)1.45 68 48 65
E-mail: Internet: <http://www.unesco.org/wfeo/>
- FEANI** **Fédération Européenne d'Associations Nationales d'Ingénieurs/
European Federation of National Engineering Associations**
Mr. Philippe Wauters
21 rue du Beau Site, B-1050 Brussels, Belgium
Phone: +32.2.639 0390 Fax: +32.2.639 0399
E-mail : secretariat.general@feani.org Internet: <http://www.feani.com>
- ECF** **European Construction Forum**
ECF Secretariat
Dr. Ulrich Pätzold, c/o FIEC, Avenue Louise 66, B-1050 Brussels, Belgium
Phone: +32.2.514.55.35 Fax: +32.2.511.02.76
E-mail: info@fiec.org Internet: <http://www.ecf.be/>
- EFCA** **European Federation of Consulting Associations**
51, rue de la Concorde , 1050 Brussels, Belgium
Phone.: +32.2.512.8938 Fax: +32.2.512.3265
E-mail: efca@efca.be Internet: www.efcanet.org
- SEFI** **Société Européenne pour la Formation des Ingénieurs/
European Society for Engineering Education**
Headquarters: 119, rue de Stassart, B-1050 Bruxelles,
Phone: + 32 2 502 36 09 Fax: + 32 2 502 96 11
E-mail: info@sefi.be Internet: <http://www.ntb.ch/SEFI/Index.html#Index>
- ECCREDI** **The European Council for Construction Research, Development
and Innovation**
ECCREDI Executive Secretariat, c/o CSTC/WTCB
Boulevard Poincaré 79, B-1060 BRUSSELS
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E-mail : info@eccredi.org Internet: www.eccredi.org

ECCE Member Organisations also have bi-lateral links and relationships with a great number of civil engineering organisations world-wide.

Through their professional activities, members of ECCE's Executive Committee also encourage further international contacts. Recent contact has been made with the following: Canadian Society of Civil Engineering based in Montreal, Canada <http://www.csce.ca>, Korean Society of Civil Engineers based in Seoul <http://www.ksce.or.kr>, Conselho Federal de Engenharia, Arquitetura e Agronomia (CONFEA) of Brazil.

CHAPTER 1

THE EDUCATION SYSTEM

This Chapter is undoubtedly the longest in this book, encompassing the education systems throughout our member countries and also those of our counterparts in Japan and the United States of America.

The questions asked of members concern the following four topics:

1. General education system at present

ECCE members were asked to provide information on the education system in their own countries. The information provided outlines the university education available for civil engineering students. Where members are aware of future developments about to take place, these are also outlined.

More specific details regarding names of universities in a member country or specific departments are appended in an Annexe (see list of contents).

2. Environmental training within civil engineering education

As a result of discussions and concerns expressed by ECCE's Environment Task Force, additional questions were asked in relation to the environment as follows:

2.1 - Are modules in environmental understanding available in your country as part of an undergraduate programme?

2.2 - Are such modules mandatory?

2.3 - How are civil engineers taught about the environmental implications of their work?

3. Bologna process, application of this process

ECCE's Education Task Force has been looking at the changes being brought about in civil engineering education by the Bologna process. The Bologna Process is considered to be the most important and wide-ranging reform of higher education in Europe since the immediate aftermath of 1968. It aims to create a 'European Higher Education Area' by 2010 which will allow for mobility of staff and students and recognition of their qualifications. It seeks to set diversified national systems into a common frame based on three outcome levels – Bachelor, Master and Doctoral.

An application of such a system to the training of professional civil engineers who will then bear responsibility for major infrastructure projects is generating much discussion across the EU. A civil engineering perspective of this process is set out as an Addendum to this publication (see list of contents).

4. Foreign Language learning

In late July 2003, the European Commission announced that it had adopted an action plan for 2004-2006 with a view to boosting language learning. The objectives stated that "Language learning is a lifelong activity. Teaching should start as early as possible (even at pre-school level) and quickly cover two languages in addition to the child's mother tongue, and should continue into higher education and adult education". An additional question to members sought to ascertain if language learning was encouraged within civil engineering education in Europe.

COUNTRY	
Croatia	<p>General education system at present</p> <p><i>University Education</i></p> <p>University level civil engineering studies are organised at four out of six Croatian Universities. The civil engineering studies cover all areas of civil engineering: structures, water engineering, roads and railways, construction management, construction materials, geotechnics, etc. The time needed to complete the civil engineering studies has recently been extended to 4.5 years or nine semesters. In the course of these studies, students are required to pass approximately 45 examinations and to prepare their bachelor's degree thesis. At the end of their studies, students obtain the title of Graduate Civil Engineer. This category of professionals is educated for high-level professional work in design, construction supervision, complex construction work as well as for scientific research. Master of Science (MSc) level may be obtained after additional two years of studies, and doctoral level (PhD/ScD) three years after completion of MSc studies.</p> <p><i>High School Education</i></p> <p>The civil engineering curriculum is offered at five technical high schools. The studies last three years or six semesters. Students are required to pass 30 examinations and to write a final diploma paper, after which they obtain the title of Civil Engineer. This category of students is educated to work on construction projects and at various public administration positions.</p> <p>Environmental training within civil engineering education:</p> <p>Modules are to be introduced at Levels 2 and 3. These modules will be compulsory at Level 2 and voluntary at Level 3. Some environmental topics have recently been introduced in water engineering courses. Environmental courses are offered at university-level inter-faculty postgraduate studies in chemistry, civil engineering, space planning, social sciences, as well as in health and law sciences.</p> <p>Bologna process:</p> <p>After the oncoming implementation of the Bologna programme, the curriculum tailored to this system is expected to offer more flexibility to students and teachers alike. The construction industry is not included in this process and has not formulated a clear opinion about the oncoming changes.</p> <p>The new law on higher education has been in force since September 2003. The orientation of the higher education system is now shifting towards the Bologna system (3+2+3 system), although the new law also proposes an alternative solution (4+1+3). Three educational levels are currently planned, and should formally be implemented as of the academic year 2005/2006.</p> <p>These three steps are :</p> <p>Level 1: Three-year undergraduate studies - Bachelor of Science in Civil Engineering</p> <p>Level 2: Two-year graduate studies - Graduate Civil Engineer</p> <p>Level 3: Three-year postgraduate studies - PhD/ScD (Doctor of Civil Engineering).</p>

<p>./.. Croatia</p>	<p>In Croatia, higher education civil engineering programmes are offered at the following universities: University of Zagreb, University of Split, University of Rijeka and University of Osijek.</p> <p>Foreign language learning</p> <p>English and German are obligatory for all degrees of engineering studies. Students entering the university already have some basic knowledge of foreign languages, as foreign languages are taught in Croatia continuously from the age of nine onwards. At the university level, foreign language studies focus on broadening of professional vocabulary, and on development of speaking skills.</p>
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<p>Cyprus</p>	<p>General education system at present</p> <p>The University of Cyprus is a new University and the engineering faculty was established in 2003. Civil engineering courses started in the University in September 2003. Until now, all Cypriot Civil Engineers were educated in foreign universities, mostly British, Greek and American universities.</p> <p>Only the Government-run Higher Technical Institute offered three-year diploma courses for Technician Engineers. There are also a number of private colleges offering courses for Technician Engineers.</p> <p>Environmental training within civil engineering education</p> <p>There are modules in environmental understanding as part of the undergraduate programme. Some of the modules are mandatory.</p> <p>Specific lectures and seminars are organised by the Cyprus Technical Chamber and the Civil Engineers Associations in order to educate civil engineers about the environmental implications of their work.</p> <p>The University of Cyprus has not yet fully adopted the system, but is in the process of adopting it.</p> <p>The University of Cyprus offers two civil engineering four-year full-time courses.</p> <ul style="list-style-type: none"> (a) BSc in Civil Engineering and (b) BSc in Civil Engineering and Environment <p>Postgraduate MSc and PhD research courses will soon be available in the University of Cyprus.</p> <p>Bologna process</p> <p>Since the University of Cyprus is just starting the civil engineering courses, it can easily adopt the Bologna System.</p> <p>Foreign language learning</p> <p>The English language is taught as a subject in the civil engineering degree. Other languages may be taken as optional.</p>
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<p>Czech Republic</p>	<p>General education system at present</p> <p>The main principles in preparation of Bachelor and Master degree programmes at civil engineering faculties in the Czech Republic were defined with regard to the following issues: valid legislation on higher education, Accreditation Committee requirements, professional chambers demands, the Union of Entrepreneurs in Building Industry and EU directives for the profession. Study programmes which have been proposed and are mostly already approved are evaluated from the point of view of their link to the completed type of college study (high school); with regard to the professional requirements, especially in the Bachelor degree (BC) programme, and with respect to student mobility within the Czech Republic and abroad during their studies. The linkage to the lifelong learning system is described below.</p> <p>Czech Civil engineers mainly graduate from three Universities:</p> <ul style="list-style-type: none"> - CVUT Praha , Faculty of Civil Eng. - TU Brno, Faculty of Civil Eng. - TU Ostrava, Faculty of Civil Eng. <p>Faculties of civil engineering in the Czech Republic underwent an accreditation procedure in June 2001. Accreditation has been granted for a limited period according to the Act on Universities and its amendments of 1st July 2001.</p> <p>Standard study length in a BC programme is between three and four years, a Master programme requires an additional one to three years. Another option is to study in a self-paid study programme within lifelong learning. Successful graduates of such a programme can be granted as much as 60% of credits, enabling them to complete full studies, including the granting of a diploma.</p> <p>The common background for preparation of study programmes was dealt with at the general meeting of civil engineering faculties of the Czech and Slovak Republics in September 2001. At that time decisions were made relating to starting BC studies - to commence from academic year 2003/2004 at the latest. At that time it was also indicated that the civil engineering faculties in Prague and in Ostrava were preparing a standard length (4-year) BC programme. The decisions seemed suitable, due to an amendment of Act no. 360/1992 Coll. on authorised architects and authorised engineers and technicians in the construction industry.</p> <p>The amendment of this Act should determine the requirements for European Commission Regulation no. 85/384 on mutual recognition of diplomas, certificates and similar documents in the field of architecture. Regulation no. 85/384 contains provisions to facilitate the right to carry out business and for free movement of services within the construction industry. The Structural engineering and Architecture study programmes should take into consideration both the requirements of the afore-mentioned regulation and the recommendations of the Accreditation Committee. These recommendations were sent to the Czech faculties that provide the study programme indicated above.</p> <p>Environmental training within civil engineering education</p> <p>Concepts and trends</p> <p>Environmental protection and sustainable development can be classified among very important topics for all three stages of civil engineering education in the Czech Republic (bachelor, master, doctor). A major target is to synthesise ecological and environmental knowledge with the gamut of civil engineering disciplines. Properly trained civil engineers must be able to</p>
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<p>./..</p> <p>Czech Republic</p>	<p>protect the environment and effectively use resources.</p> <p>All Czech Civil Engineering Faculties have approved the new structured study programmes, branches of study and subjects curricula from the previous academic year. The programmes are designed so that, after completion, the graduate will:</p> <ul style="list-style-type: none"> • acquire high-quality knowledge related to environmental protection and sustainable development; • get familiar with legal regulations in the Czech Republic and EU (Planning and Building Law); • be able to analyse, investigate and manage the projects in his branch of study also from the point of environmental aspects; • be able to develop environment-friendly policy with full responsibility towards the society. <p>The higher education institutions have prepared compulsory and elective courses devoted to environmental protection and sustainable development, for example Civil Engineering and Environment, Environmental Protection, Environmental Engineering, Air Pollution, Environmental Hydraulics, Environmental Impacts, Water Quality and Pollution Control, Applied Ecology for Engineers, Ecology, Environmental Impact Assessment, Environmental and Remote Sensing, Environmental Geology, Environmental Protection of Urban Area, Pollution Control of Urban Areas, Soil and Groundwater Protection, Waste Disposal, etc.</p> <p>Some problems relating to these issues are embedded in subjects such as: Building Construction, Building Physics, Maintenance and Rehabilitation of Buildings, Construction Quality, Building Services Systems, Sanitary Engineering, Water Supply and Sewer Systems, Water Treatment, Design of Buildings, Advanced Design in Building Construction, City Planning, Regional and Urban Planning, Analysis of Urban and Environmental Systems, Land Use Planning, Planning and Building Law, etc.</p> <p>Due to the Czech law on higher education, all courses can be attended by the public and are also regularly offered by the Czech Chamber of Chartered Engineers and Technicians as a part of the lifelong learning system.</p> <p>Bologna process</p> <p>The Bologna process was applied as a two tier system: this is completely changing the Czech higher education system, but not only for civil engineers. The content of study programmes is approved by the Czech governmental Accreditation Commission.</p> <p>The principles of the Bologna process were applied at the Civil Engineering faculties of Czech Universities from autumn 2003. The Bachelor's degree can be obtained after four years of study. A further one and a half years are required for the Master's Degree and an additional three years for Ph.D. study.</p> <p>The study load is defined by ECTS system (240 credits are necessary to obtain a Bachelor's Degree, 90 credits for Master's Degree).</p> <p>The Czech system of higher education is easily readable and comparable through the implementation of the Diploma Supplement. It promotes the necessary European dimensions in higher education, particularly with regard to curricular development, inter-institutional cooperation, mobility schemes and integrated programmes of study, training and research.</p> <p>Foreign language learning</p> <p>The English language is taught as a subject in the civil engineering degree. Other languages may be taken as options.</p>
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<p>Estonia</p>	<p>General education system at present</p> <p>There was a unitary Engineering education system and unique study programmes in all of the Soviet Union until 1991 when Estonia regained its independence.</p> <p>Pre-university education lasts for 12 years in Estonia.</p> <p>There are three higher educational institutions:</p> <ul style="list-style-type: none"> • Tallinn Technical University • Estonian Agricultural University (located in Tartu) • Tallinn College of Engineering <p>The education of civil engineering specialists at Tallinn Technical University (TTU) lasted five years and the courses met the requirements of the traditional curricula of diploma engineers until 1994. In addition, an applied engineering scheme (lasting four years) was introduced in 1991 and the Faculty of Civil Engineering started to provide higher education for production purposes. That scheme was not viable and admission to the applied scheme then ceased. The structures, which had been developed within the framework of the 1992 academic reforms in TTU after Estonia regained independence, enabled radical reorganisation, updating the university education system and the system of disciplines.</p> <p>In 1995, the transition to bachelor studies was implemented. However, students of earlier admissions continued their studies according to the curricula of diploma engineers. The field of civil engineering was extended to the domain of civil engineering and the study fields were narrowed down to the fields linking close specialities and enabling organisation of common basic, general and core studies.</p> <p>Since 1995 new students have applied for admission directly to the domain of civil engineering. The competition between students for available places funded from the state budget has been two to two and a half people per place and is gradually increasing.</p> <p>Until 2002, the nominal time of studies was four years for the bachelor's degree, four years for diploma studies (three specialities) and two years for the master's degree and four years for the doctor's degree. Starting from autumn 2002, new curricula were introduced for engineers, established on integrated curricula of bachelor and master studies. The nominal duration of studies will be five years and the completion of such a course will give qualifications equalling that of the master's degree courses, whereby the University can award master's degrees to graduates.</p> <p>Graduates from the engineering diploma studies may continue studies for a doctorate, with the nominal duration being four years. The previous system had not allowed for providing civil engineers with adequate knowledge and skills by the time they graduate.</p> <p>There is an 'imaginary' line in the new curricula of civil engineering study field after 120 credits (nominal time of three-year studies) and after passing examinations in certain defined disciplines. Essentially this would mean meeting the requirements of the bachelor's degree programme.</p> <p>According to the new curricula for engineers, the study field of architecture and civil engineering in the domain of civil engineering is divided into three specialities, which in turn allows differentiation in specialisation.</p>
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<p>./.. Estonia</p>	<p><i>Civil and building engineering:</i> <i>Building engineering</i> <i>Construction economics and management</i></p> <p><i>Environmental engineering:</i> <i>Water engineering</i> <i>Heating and ventilation</i> <i>Environmental management</i></p> <p><i>Transport engineering and engineering survey:</i> <i>Road engineering</i> <i>Engineering survey</i> <i>Logistics</i></p> <p>Graduates entering the civil engineering profession may start working as practising engineers, and after some years of practice may apply for Chartered Engineer status or for diplomas of European engineers. They can also continue their studies in the doctoral studies programme and after graduation choose the profession of a professor or researcher.</p> <p>Logistics is a separate field, belonging to the domain of services and the study field of transport services. The nominal duration of studies is three years for a bachelor's degree and two years for a master's degree. Students are admitted to the Faculty of Civil Engineering and formally they will remain in the Faculty of Civil Engineering. Undergraduates in logistics are offered a comprehensive knowledge of engineering, economics, law and information technology, which will enable graduates to take up responsible posts in all sectors.</p> <p>In addition to the courses defined earlier, post-graduates with a bachelor's degree will be admitted to master's degree courses in the coming 2-3 years. They will be offered master's degree programmes in civil engineering, environmental engineering and transportation engineering according to the earlier curricula.</p> <p>University studies are organised in compliance with the University Law and Standard of Higher Education.</p> <p>Environmental training within Civil Engineering Education</p> <p>One of the departments in the Faculty of Civil Engineering is named the Department of Environmental Engineering. Naturally, the modules of environmental understanding are mandatory for the students of that department.</p> <p>For the other students of the Faculty of Civil Engineering modules of environmental education are included into the programmes of general studies and so they are mandatory.</p> <p>Bologna process</p> <p>Foreign language learning</p> <p>Foreign language learning in the University is the continuing process after graduating from secondary school.</p> <p>Foreign language learning for academic purposes and for science and research, too, is mandatory, thus it is included in the programmes of general studies.</p>
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<p>Finland</p>	<p>General education system at present</p> <p>The Finnish education system is presented in fig. X (see appendix at the end of this publication). Education is compulsory until the age of 16. After that you may continue in an upper secondary school for three to four years. After passing the relevant examinations (“Student exam”) you can apply to study at university.</p> <p>To study at a university you must pass the entrance exam. Also, the final upper secondary school report and the grades in your student exam will affect your possibilities to study for a degree at university.</p> <p>There are two technical universities which offer a versatile education in civil engineering, Helsinki and Tampere. The technical universities in Oulu and Lappeenranta also offer training in certain areas of civil engineering, mainly in environmental and energy engineering.</p> <p>The students usually try to obtain a Master’s degree (“diploma engineer”). Theoretically this requires four and a half years of studies and a Diploma work of half a year. In practice the studies for the Master’s degree take an average of five and a half to six years. After the Master’s degree you may continue postgraduates studies for a Licentiate’s or a Doctor’s degree.</p> <p>Instead of university studies, you can enter one of the 17 technical polytechnics, which offer education in Civil Engineering. A polytechnic degree requires three and a half to four years of studies. Some polytechnics have entrance exams. An examination result from the upper secondary school is not necessary, but most students have one. Another means to enter polytechnics is following completion of examinations from vocational schools. After obtaining a degree from a polytechnic you also have the possibility to apply for university studies.</p> <p>Environmental training within civil engineering education</p> <p>Environmental training is an important part of the education in technical universities. There are mandatory modules in the civil engineering education concerning environmental impacts of technology and methods to minimise the environmental burden. There are also specific courses concerning environmental issues like water and wastewater engineering.</p> <p>A new way of taking into account environmental aspects in civil engineering, called lifetime engineering, is also gradually becoming more important, both in universities and polytechnics. Lifetime engineering deals with optimising energy and material use including ecology and economics aspects and with methods for designing and maintaining structures (houses, bridges, roads, etc.) that take into account environmental loads and the true behaviour of the structures as a function of time.</p> <p>Bologna process</p> <p>The principles of the Bologna process will be applied in the universities in the autumn of 2005. A Bachelor’s degree can be obtained after three years of studies. A further two years are required for the Master’s degree. The universities recommend a Master’s degree for all students.</p>
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Finland**

Foreign language learning

Learning of foreign languages has always been of great importance in the Finnish education system, starting in the compulsory basic education (ages 7 to 16). In addition to the second official language in Finland, Swedish, practically all students in compulsory schooling also learn English quite well.

In some schools mainly German or another language can be an alternative to English. Usually German is also chosen as a foreign language, but with a shorter period of study. Usually all students learn three other languages in basic education in addition to their own.

At upper secondary level (ages 17-19), besides English, usually German and French, and in some schools Spanish and Russian can be chosen as an additional or optional language.

In universities foreign language learning continues and consists of mandatory and optional courses in different languages. Also a part of the classes including textbooks are in English. Textbooks may also be in other languages.

In polytechnics, the same principles apply, but to a lower degree.

<p>France</p>	<p>General education system at present</p> <p>The French education system is based on compulsory secondary schooling up to the age of 16. It is followed by the “Lycée” which, after three years’ studies leads to the “Baccalauréat” certificate.</p> <p>Later on, the title of “Ingénieur Diplômé” could be obtained, using one of the following means (around 25,000 Engineers each year, all engineering disciplines in total). All of them require five years of studies, following a 2+3 year scheme. This title offers the “Master Degree”.</p> <ul style="list-style-type: none"> - Engineers ‘Grandes Ecoles’ System (54%) (‘Grandes Ecoles’ are higher educational institutions that award degrees after five or six years of study following the ‘baccalauréat’) <ul style="list-style-type: none"> • Two years in “Lycée” Classes, after baccalaureat, preparing for the entrance examination to ‘Grandes Ecoles’ • Examination • Three years of engineering studies in a ‘Grande Ecole’ - Integrated studies in engineering ‘Grandes Ecoles’ (29%) <ul style="list-style-type: none"> • Two years of higher education as Integrated cycle of the Grande Ecole • Continuous assessment of knowledge • Three years of engineering studies - Engineering Studies within the universities (13%) <ul style="list-style-type: none"> • Two years’ study to obtain “Diplôme Universitaire de Technologie (DUT)” or “Diplôme d’Etudes Universitaires Générales (DEUG)” • Selection based on studies file and interview (or examination) • Three years of engineering studies - ‘Grande Ecole’ or University/Enterprise Alternation Formation, in connection with continuous education (4%). <ul style="list-style-type: none"> • Two years’ study to obtain the ”Diplôme Universitaire de Technologie (DUT)” or “Brevet de Technicien Supérieur (BTS)” • Selection based on studies file and interview • Three years of studies, alternatively in a ‘Grande Ecole’ or in companies. <p>Moreover, a title of “Ingénieur–maître” can be delivered by “Instituts Universitaires Professionnels (IUP)”. Another means to obtain an engineering qualification, is through “Instituts des Techniques d’Ingénieur de l’Industrie (ITII)”: this route is developed in chapter 14, since this is linked to the continuous education process.</p> <p>Generally speaking, civil engineers engaged in private business have mainly graduated from “Ecole Spéciale des Travaux Publics”, “Ecoles Nationales Supérieures des Arts et Métiers”, “Instituts Nationaux des Sciences Appliquées”, “Ecoles Nationales des Mines”, “Ecoles Centrales”, “Ecole Nationale des Ponts et Chaussées”, “Ecole Nationale des Travaux Publics de l’Etat”, “University Engineering Schools” (open list).</p> <p>Central and local public authorities recruit “Ingénieurs Diplômés” in civil engineering, as civil servants, mainly from “Ecole Nationale des Ponts et Chaussées”, “Ecole Nationale des Travaux Publics de l’Etat”, “Ecole d’Ingénieurs de la Ville de Paris”.</p>
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<p>./.. France</p>	<p>Environmental training within civil engineering education</p> <p>In the schools of engineering, there are generally no specific environmental studies. Nevertheless, the “Ecole Centrale de Nantes” includes a “Département de Génie Civil et Environnement” in which environment has an important place.</p> <p>The environment, however, is a significant component in all main technical matters, for environment is part of the “basic culture” of students. For example, environment and sustainable development are treated within water supply, waste treatment (etc.) and they are major points taken into account by students at the time of the “designs”.</p> <p>Moreover, in some high schools, environment is effectively introduced as a specific option carried out at the final stage of studies.</p> <p>Bologna process</p> <p>The Bologna Declaration (three-, five-, eight-year system).</p> <ul style="list-style-type: none"> ○ As indicated previously, the French education system for engineers through high schools is based on a (2+3) system, which is different from the (3+2) Bologna system. <p>Nevertheless, in “Grandes Ecoles”, efforts are in progress in order to adapt their practice to the new system (for example a “Bachelor Diploma” delivered at ESTP after three and a half years of studies).</p> <p>The “Engineers Diploma” is delivered after five years of studies, in agreement with the Bologna Declaration. “Engineer Diploma” applies as “Master” graduation. Organisation of specific European Masters (Professional Masters, Research Masters...) is in progress in several higher educational institutions.</p> <p>Doctorate Degree, being delivered in France after eight years of study, is also in agreement with the Bologna Process.</p> <ul style="list-style-type: none"> ○ In universities, the implementation of the (three, five, eight) system is in progress. The three-year level, named “Licence” can, under some conditions, allow students to have access to higher educational institutions for engineering. <p>Foreign language learning</p> <p>It may be considered that the learning of foreign languages within the academic process generally involves “English” as the ‘first’ foreign language, followed by “Spanish” and “German” as the next favoured foreign languages.</p> <p>English now has become obligatory.</p>
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<p>Germany</p>	<p>General education system at present</p> <p>German pupils who want to study must pass as a minimum, a successful education of 12 or 13 years at a Gymnasium or other school which offers Tertiary Education. If they have successfully completed a 13-year education, they may study any professional and/or academic curriculum at any university (Normal University, Technical University, University of Applied Sciences). To study at Fachhochschulen (University of Applied Sciences), it is sometimes only necessary to undergo a special technically-oriented education of 12 years at a school with the equivalent technically-oriented education programme.</p> <p>The education of civil engineers takes place at institutions of higher education and requires a minimum of four years of full time studying and teaching. Normally there are two types of academic institutions: Technical Universities (TU) and Universities of Applied Sciences (Fachhochschulen (FH)).</p> <p>There are slight differences in the entry requirements. Before entering the FH students must successfully complete a 12-year technical education and must undergo a period of practical training lasting up to six months. Many of the young people have a full professional education as carpenter, bricklayer, craftsman etc. and in addition a 13-year education (Abitur). The entry requirement for TU-students is simply successfully passing the 'Abitur' examination.</p> <p>The duration of undergraduate studies for FH-students is four years of full-time study. This normally includes a full practical placement semester (normally the fifth semester) and finishes with a diploma thesis about a problem relating to the building industry. The thesis is part of a second practical placement and is normally supervised and examined by the university and, very often, the respective company.</p> <p>The education at a TU requires a minimum of five to six years' study and is more theoretically based. In the middle of the course there is a pre-diploma examination, but no practical experience is required. Education is completed upon conclusion of a diploma thesis which is normally the result of a complex research programme.</p> <p>Both graduates get the degree of "Dipl. Ing." (diploma engineer); the graduates of FHs are awarded "Dipl. Ing. (FH)", those from universities have no additional indication. Both civil engineers can enter the building job market immediately. The salary and the status in governmental bodies are slightly different. Whereas FH engineers normally find their working places in building and related companies at building sites and in middle management, TU-engineers are more research-oriented and their qualifications lead them to senior management positions or academia'.</p> <p>At Technical Universities civil engineers can obtain a doctor's degree (Dr. Ing.) which is highly respected within both the academic and professional community, not only in Germany. This requires two to three years' experimental work and a final examination. Depending on the qualification they obtain, civil engineers with a certificate Dipl. Ing. (FH) from a University of Applied Science may have the possibility, but not the right, to enter a PhD-programme.</p> <p>The highest academic qualification is the "Habilitation" (Dr. habil.) which is undertaken to work towards an academic career and to gain a professorship.</p>
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<p>./.. Germany</p>	<p>Environmental training within civil engineering education</p> <p>Nearly all universities offer modules connected with environmental topics. Some of these are mandatory for every student e.g. building/environmental physics, waste water treatment etc. In addition a number of universities offer specialisation programmes for civil engineers to work later as environmental civil engineers.</p> <p>There are very few special modules targeting this very topic. One will find such questions and implications as part of the normal educational modules. But they are mostly treated in a more technical or legal manner. Ethical aspects play a rather small part in the education and up to the present time a special module on ethics in the built environment is rare, however experience acquired during their practical placement semester is most appropriate to this question.</p> <p>Bologna process</p> <p>The Bologna process introduced the two tier system: this is completely changing the German education system, but not only for civil engineers. All German universities have to follow this line and most of them are commencing this system with the enrolment of students no later than the winter semester 2005/2006.</p> <p>The education offered for a Bachelor's degree in civil engineering is open for all universities, the required duration is six, seven or eight semesters and it trains students for employment. The subsequent education for a Master's degree is also open for all universities and the required duration is two years, one and a half years, or one year - depending on the time taken to achieve the Bachelor degree. The given title of Master's Degree shall include the difference in education as "more research" or "more practically" oriented. The Bachelor degree will not have such an indication.</p> <p>All new study programmes must be modularized. Their content has to be judged by the study load and credited by ECTS¹. All programmes have to be accredited by agencies which are officially accredited by the government.</p> <p>In the field of civil engineering there are two such agencies:</p> <p>ASIIN the accreditation agency for education in engineering and natural sciences and informatics under the umbrella of (but not a section) of the German VDI (Verein Deutscher Ingenieure); the agency ASB of study programmes in building and construction is an agency directed by the German building industry and the Chambers of Engineers of the Länder. Both agencies follow the recommendations of the German building associations and companies to provide an education of at least three and a half years for a Bachelor degree and of at least five years for a Master degree in Civil Engineering.</p>
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¹ European Credit Transfer and Accumulation System, a student-centred system based on based on the student workload required to achieve the objectives of a programme: these are preferably expressed in terms of learning outcomes and competences to be acquired: Please see http://europa.eu.int/comm/dgs/education_culture/publ/pdf/ects/en.pdf for further information

<p>./. Germany</p>	<p>Foreign language learning</p> <p>Foreign languages are a must for all German students.</p> <p>All students and, thus, all (civil and construction) engineers have learnt at least two languages at school. English is obligatory and often starts in the third class of school at the age of eight or nine years. The second foreign language starts in the 7th class, and a third one is offered in class 9.</p> <p>On top of this English language knowledge, all students have the possibility to attend English classes to learn professional and standardised words and discussion or rhetoric skills. In a number of civil engineering educational curricula with a clear target for internationalisation and cooperation with partner universities these lectures (often two modules totalling four hours per week for a whole year) are obligatory. English is sometimes not treated as a "real foreign" language, because it is considered to be part of the professional world of a civil engineer.</p> <p>Concerning the international aspect of a civil engineering education, in close co-operation with a partner university and a two- or three-semester study period abroad, students have to learn a second foreign language in-depth in order to attend classes abroad and to work on a building site there. Very often these are the major languages such as French, Spanish or Russian or that of a neighbouring country e.g. Dutch, which many students had learnt at school.</p> <p>For German civil engineers the Chinese language is becoming more and more important.</p>
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Greece	<p>General education system at present</p> <p>Civil Engineering studies are provided in a University level in full time five-year courses, mainly in Polytechnic Schools. The oldest Polytechnic School is the National Technical University of Athens (Metsovion Polytechnion) but today there are also the Polytechnic Schools of the Aristotelian University in Salonica, of the University of Patras, and the Democritous University in Trace. There is also a course of administrative and engineering management oriented studies in the Polytechnic School of Crete in Chania.</p> <p>The existing professional civil engineers have graduated as follows:</p> <ul style="list-style-type: none">40 % from National Technical University of Athens30 % from Salonica Polytechnic School8 % from University of Patras10.5 % from University of Trace11.5 % from foreign countries' universities <p>Bologna process</p> <p>All civil engineering courses are of a full five-year duration and the Bologna System has not yet affected our educational system. As a matter of fact, both Academic and Professional organisations are opposed to the Bologna system. The Ministry of Education now sets a system of accreditation of Universities and studies.</p> <p>Environmental training within civil engineering education</p> <p>Environmental issues of engineering are part of the undergraduate studies of a civil engineer.</p>
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<p>Hungary</p>	<p>General education system at present</p> <p>Note: Hungary has about 10 million inhabitants. The number of students in pursuit of higher education degrees is about 300,000.</p> <p>The Educational Process for Civil Engineers</p> <p>The Ministers of Education of 30 European countries (among them Hungary) signed the Bologna Declaration on the 19th June, 1999. The Bologna Declaration determines, among others, the following objectives as well:</p> <ul style="list-style-type: none"> - Implementation of the Diploma Supplement, in order to promote the employability and the international competitiveness of the European higher education system. - Adoption of a system essentially based on two main cycles, undergraduate and graduate. - Establishment of a system of credits - such as in the ECTS – as a proper means of promoting the most widespread student mobility. <p>The Hungarian Equivalence and Information Centre deals with the topic of international academic and professional recognition and the dissemination of the Diploma Supplement. The centre has published a Diploma Supplement handbook in Hungarian containing information on the Diploma Supplement, the prototype of a Hungarian Diploma Supplement, up-to-date Hungarian-English terminology, and practical advice for the implementation of the Diploma Supplement in Hungary. It is compulsory for the universities to provide their students with a Diploma Supplement.</p> <p>All Hungarian higher education faces great change, the Bologna process is only a part of it. For months there has been a very severe (political) discussion on the draft of the new Higher Education Law. The draft contains great changes to the existing system, for instance universities would be directed by executive boards.</p> <p>Practically, the implementation of the Bologna process is going on independently from the previous process, based on a government order draft, entitled "Some rules on the implementation of more cycles, linear higher educational structure and the conditions for the commencement of the first educational cycle". We call the first educational cycle to basic education in Hungary (Bachelor - BSc level) and we call the second educational cycle to master education (Master - MSc level). There are some so called 'undivided courses' (medical, art, law) which are not involved in education with 'more cycles'. According to the recent plans, the basic courses would start on a voluntary basis in 2005 in an experimental manner and would become compulsory in 2006. This means that from 2006 all students can enroll for basic course (and according to the plans 30-50% of the students can continue their studies in a master course). In the process of implementation the engineering education is the best (and perhaps the most 'economical' education) because in this field the market demand of BSc is unambiguous as well. (Recently there is a total uncertainty for instance in the field of two-cycle teacher education). Those higher educational institutions which want to start basic education (BSc) in 2005, had to apply for it to the Hungarian Accreditation Board (with detailed curriculum, personal and objective condition). The deadline began in September, 2004 for the application and the end of year 2004, this new possibility was published in the 2005 Entrance Guide. Most engineering institutions applied to start BSc courses.</p>
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<p>./. Hungary</p>	<p>The Committees of Rectors' Conference (cooperated with professional organisations) elaborated the educational and output requirements of the courses.</p> <p>The government order draft determined in "the engineering educational field" 8 "educational branches" and inside the branches 19 "basic courses" (BSc) as follows:</p> <ol style="list-style-type: none"> 1. Material-, wood- and light industrial educational branches (210+120 credits): Material engineering, timber engineering and light industrial engineering basic courses. 2. Bio-, environmental- and chemical engineering educational branches (210+120 credits): Bio engineering, environmental engineering and chemical engineering basic courses. 3. Civil engineering and technical earth science educational branches: Civil engineering (240+90 credits) and technical earth science (210+120 credits) basic courses. 4. Architect-engineering, industrial product and form design educational branches: Architect course (undivided course, 300 credits). Architect-engineering (240+90 credits), industrial product and form design (210+120 credits) basic courses. 5. Mechanical-, transport-, mechatronics engineering educational branches (210+120 credits): Mechanical engineering, transport engineering, mechatronics engineering basic courses. 6. Military- and security technical engineering educational branches (210+120 credits): Military- and security technical engineering basic course. 7. Electrical- and energetics engineering educational branches (210+120 credits): Electrical engineering and energetics engineering basic courses. 8. Technical manager, technical trainer educational branches (210+120 credits): Technical manager, technical trainer basic courses. <p>Notes:</p> <ul style="list-style-type: none"> - According to the present plan the number of master courses will not be limited. - The Architect education separates from the Architect-engineering education. - The Civil engineering and the Architect-engineering basic courses are longer (240 credits) than the others because of design licence requirements. - The opinion of the professional organisations is that the number of basic courses (19) is too high, this large number is the result of lobbying. <p>In Hungary all engineering institutions had implemented the system of credits (ECTS).</p> <p>Foreign Language Learning</p> <p>In Hungary one "state language exam" is prescribed (independent from the university) for the BSc level diploma and two "state language exams" for the MSc level diploma.</p> <p>Environmental training within civil engineering education</p> <p>Modules in environmental understanding are available in Hungary as part of the undergraduate programme. Such modules are not mandatory.</p> <p>Bologna process</p> <p>(Please see note on the Educational System, above).</p>
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<p>Ireland</p>	<p>General education system at present</p> <p>1. Pre-university education</p> <p>Pre-university education in the Republic of Ireland comprises primary education (usually from ages 6-12) and secondary education (usually from ages 13-18). Secondary education is normally for six years with state examinations at the end of Year 3 (Junior Certificate) and Year 6 (Leaving Certificate). The examinations in each subject can be taken at 'Ordinary' or 'Higher' level. Secondary education follows a broad curriculum, with most pupils taking between six and eight subjects at Leaving Certificate. The majority of students take Mathematics, English and Irish and select their remaining subjects from the sciences, languages, business, art, music and vocational courses. From the perspective of engineering, a worrying trend in the last decade has been the reduction in the number of students taking physics and chemistry.</p> <p>In Ireland, in year four of the secondary system many schools offer a so-called 'transition year'. This is based more on project-related activities than formal classes/examinations, and students are also given the opportunity of gaining some limited work experience. There is also a significant number of post-Leaving Certificate courses available in vocational subject.</p> <p>2. General view on engineering education</p> <p>2.1 Engineering education at under-graduate level. Engineering education in the Republic of Ireland normally comprises a four-year undergraduate course (but in some cases five years, see below) leading to a Bachelor of Engineering Degree (BAI, BEng, BE, BScEng depending on the institution). Engineering Degree courses are accredited by the Institution of Engineers of Ireland (IEI). Graduates from accredited degree courses can achieve professional recognition through the IEI by seeking election as a Chartered Engineer, usually after having acquired at least four years' relevant experience and postgraduate training.</p> <p>2.2 Engineering education at postgraduate level Masters programmes are of two types: taught courses (usually one year full time, two years part time) or research (usually two years). The degree awarded is an MSc. Doctoral programmes are nominally of three years' duration, but often take four years or longer to complete. The degree awarded is a PhD.</p> <p>3. Civil engineering education</p> <p>3.1 Undergraduate education In the Republic of Ireland undergraduate degree courses in civil engineering and related disciplines are offered both by university colleges and by institutes of technology (ITs). Summaries of the relevant university and IT degree courses are set out sub-sections a) and b) below, while comments on such details as contact hours and term lengths are included in c). Degree courses in civil engineering (university colleges) There are four university colleges in the Republic of Ireland that offer undergraduates degrees in civil engineering (listed in Annexe to this chapter). All of these degree courses are of four years' duration, and are accredited by the IEI.</p>
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Ireland**

3.2 Civil engineering education at post-graduate level

The one year taught masters courses usually run from September to September. They typically comprise lecture terms (or semesters), written examinations, and a major dissertation (the latter to be completed over a three- to five-month period).

Masters by research and doctoral these are examined by internal and external examiners appointed by the university; the assessment process include a viva voce. In some institutions, research students are required to take a limited number of relevant courses from taught masters programmes.

Environmental training within Civil Engineering Education

Bologna process

In February 2004 the IEI published its position on the Bologna Declaration in a document entitled "A New Structure for Engineering Education in Ireland – Implementation of the Bologna Declaration". This advocates a five-year integrated Master Degree programme as the new educational standard for the title of Chartered Engineers, with a Bachelor degree awarded after third year.

Foreign language learning

There is perhaps less emphasis on foreign language and humanities courses than is the case with engineering degrees in some other European countries.

<p>Italy</p>	<p>General education system at present and Bologna process</p> <p>The new structure of the academic studies in Italy is compliant with the Bologna Declaration (3+2) and is regulated by the following Ministerial Decrees:</p> <ul style="list-style-type: none"> - 3rd November 1999, n. 509, <i>“Regolamento recante norme concernenti l'autonomia didattica degli atenei ”(Regulation on the didactic autonomy in universities);</i> - 4th August 2000, <i>“Determinazione delle classi delle lauree universitarie” (Definition of the classes of the academic Lauree);</i> - 28th November 2000, <i>“Determinazioni delle classi universitarie specialistiche” (Definition of the specialistic academic classes).</i> <p>In compliance with these decrees, the structure of the study courses has two levels: Laurea (I level) and Laurea Specialistica (II level).</p> <p>The Laurea is awarded after a three-year study course. Its objective is to supply general, scientific methods and contents and particular professional skills. After the Laurea you may:</p> <ul style="list-style-type: none"> ○ have access to the labour world immediately, ○ continue to study to be awarded the 'Laurea Specialistica', ○ apply for a I level Master. <p>The Laurea Specialistica is awarded after a further two-year study course and its objective is to supply advanced training and a high qualification in specific sectors. After a 'Laurea Specialistica' you may:</p> <ul style="list-style-type: none"> ○ have immediate access to the labour market, ○ continue to study to be awarded a Doctorate, ○ apply for specialisation courses, ○ apply for a II level Master. <p>Those who wish to matriculate in a 'Laurea Specialistica' holding a 'non cognate Laurea' or having followed a three-year 'Laurea' course targeted to the labour market, shall acquire some education credits. Some 'Laurea' courses maintain their five-year duration because they are regulated by European rules relevant to the mutual recognition among the European Union Member States (in particular those relevant to the medical and architectural professions).</p> <p>'Debts' and 'credits' in education and training</p> <p>The debts and credit system was introduced by the academic reform. The formation debt shows gaps in the formation against standard requirements, that is to say, against the minimum unavoidable skills to apply for a 'Laurea' course or a 'Laurea Specialistica' one.</p> <p>The academic formation credit (CFU) is a unit of time measured to define the work required by students. Various activities, individual study included, are comprised in the hours constituting the credit. An academic year requires an amount of work from students conventionally fixed as 60 credits.</p>
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<p>./.. Italy</p>	<p>The 'Laurea' is awarded with 180 credits. The 'Laurea Specialistica' is awarded having acquired 120 credits which are added to the 180 of the 'Laurea' (300 credits altogether).</p> <p>The acquisition of credits corresponding to a discipline is linked to having successfully passed an exam or another kind of control. It is important to emphasise that the recognition of credits does not depend on the mark acquired during examination: credits are not marks.</p> <p>Credits are adopted in the whole university system to facilitate students both to move from one course to another and from one university to another, also abroad.</p> <p>The Engineering Faculties are presently open in 40 Italian universities (Details in Annexe II).</p> <p>No training period is required by law during the academic education or before sitting for the State examination.</p> <p>After the reform, both in the Laurea and in the Laurea Specialistica courses provision has been made for a period of training (compulsory in some cases) by companies or professional societies. This training generally lasts six months and awards 8/12 vocational training credits.</p> <p>To be enrolled in Section B of the Albo , it is compulsory to hold a three-year academic title (Laurea or Academic Diploma of the old academic system) awarded by an Engineering Faculty or a Polytechnic and to have successfully passed a State Exam.</p> <p>To be enrolled in Section A of the Albo, it is compulsory to hold a 3+2 year academic title (Laurea Specialistica) awarded by an Engineering Faculty or a Polytechnic and to have successfully passed a State Exam.</p> <p>Foreign language learning</p> <p>Students have to sit for two exams, in two different languages.</p> <p>English now has become obligatory.</p>
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<p>Latvia</p>	<p>General education system at present</p> <p>Existing pre-university education system in Latvia: 12 years (nine years basic school + three years secondary school), starting from six years of age.</p> <p>The system of higher education in Latvia is binary since the Law on Education Establishments (1995) sets a difference between academic and professional higher education. The popularity of professional programmes is growing rapidly - in the academic year 1998/99 professional programmes attracted more than double the number of student enrolment compared to the Bachelor programmes. The binary structure of higher education system in Latvia however, is not strictly institutionalised, therefore, one can see universities running professional programmes and institutions not bearing the name 'university' running academic programmes. In principle, three groups of programmes can be distinguished:</p> <ul style="list-style-type: none"> - academic programmes leading to academic degrees, - professional programmes based upon a standard of the first academic degree thus making graduates eligible for further academic studies, and, finally - the applied professional programmes oriented towards higher professional qualifications but not providing a background for direct admission to further academic studies" (1 - http://www.aic.lv/En/default.htm). <p>Professional higher education</p> <p>"The Law on professional education (1999) provides for higher professional programmes at two levels: college programmes leading to Level IV professional qualifications and professional higher education programmes leading to Level V professional qualifications. In a number of professional fields it is possible to establish college programmes as the first cycle of professional higher education.</p> <p>The College programme in Civil Engineering is opened in RTU and is of three-years' duration. It is considered as the first cycle of higher professional education. Civil Engineering at college level is also taught in Riga Construction College (Rigas Celtniecibas koledza). "</p> <p>Environmental training within civil engineering education</p> <p>Riga Technical University (RTU) offers two professional bachelor programmes with a study length of four and a half years (180 CP) in civil engineering:</p> <ul style="list-style-type: none"> • Building Construction and Reconstruction; • Transportation Engineering (Roads, Traffic management and Bridges) <p>and two academic bachelor programmes with a study length of three years (120 CP):</p> <ul style="list-style-type: none"> • Land surveying and real estate management • Heat, gas and water technology <p>Latvia University of Agriculture (LUA) offers four programmes of four years' duration :</p>
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Latvia

- Rural building
- Environmental and water resource management
- Land management
- Landscape architecture and planning

Bologna process

Both universities provide academic programmes organised at two levels in accordance with the **Bologna Declaration**. These enable students to obtain bachelor, master and doctoral degrees in civil engineering, as well as professional higher education programmes.

Foreign language learning

In general, the English language is taught as a subject in the civil engineering degree. Other languages (German, French or Spanish) may be taken as optional if it is possible to organise student groups.

Lithuania	<p>General education system at present</p> <p>Historical background: Up to 1991, there was a very strict Engineering education system and unique study programmes in all of the Soviet Union including Lithuania. Starting in 1991, the civil engineering education system in Lithuania experienced major reform. Lithuania was one of the first post-Soviet Union countries which introduced a two-tier education system even before the Bologna declaration had been signed.</p> <p>The status quo: Since 2000, there has been a non–university sector within the higher education system, i.e. colleges have been established.</p> <p>Pre-university education: It is usual for pre–university education to last 12 years. Pre-university education may be obtained in:</p> <ul style="list-style-type: none"> ▪ ordinary secondary school; ▪ gymnasium; ▪ vocational school. <p>Undergraduate study: The duration of undergraduate studies in universities is four years. Having completed the basic academic studies, graduates gain a Bachelor’s degree and the right to study for a Master’s degree or to continue studies in a specialised professional field.</p> <p>Masters degree: The duration of Master’s degree studies is of one and a half to two years’ duration, including time for preparing the thesis.</p> <p>The education of specialised studies is one year. At the end of these studies students defend their final project and obtain a professional higher education engineering qualification.</p> <p>Doctor’s degree: studies and preparation of the dissertation takes four years.</p> <p>Permanent residents and citizens of Lithuania seeking to undertake studies at undergraduate and postgraduate level are admitted according to the competition rules and without specific entrance examinations.</p> <p>Persons from foreign countries are admitted to the universities according to signed contract.</p> <p>The non–University sector of studies is expanding.</p> <p>There are five higher education institutions in Lithuania, having university study programmes in Civil Engineering. These are listed in an annexe at the end of this chapter.</p> <p>Environmental training within civil engineering education</p> <p>One of the faculties in Vilnius Gediminas Technical University is named as an Environmental Engineering faculty. Modules of environmental understanding are mandatory for the students of that faculty.</p> <p>For the remainder of civil engineering students such modules are not mandatory. There are no special programmes of environmental implications for civil engineering graduates in their work.</p> <p>Bologna process</p> <p>In 2003, the State programme was adopted for a strategic policy in education for the period 2003-2012.</p>
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<p>./. Lithuania</p>	<p>The main objective is to enter the European Higher Education Area. At present the Bologna process is in the final phase of implementation.</p> <p>A framework based on three outcome levels is already implemented in all Universities of Lithuania. The duration of Bachelor degree studies is 4 years, for the Master degree a further two or one and a half years, and for a Doctor's degree this is an additional 4 years. A Credit System is already implemented. However, one local credit is equal to 1.5 ECTS. In 2005 graduates will be issued with a Diploma Supplement for the first time. According to the Socrates/Erasmus programme, the mobility of students and staff members is quite significant. The professional recognition system needs to be improved, taking into account European Directives and legislation.</p> <p>Foreign language learning</p> <p>In addition to learning foreign languages in the secondary schools, learning a foreign language is compulsory during the first year of studies in the Universities. There are three possible options – to choose English, German or French. The total academic load amounts to 6 ECTS.</p>
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<p>Poland</p>	<p>General description of academic education system in Poland</p> <ol style="list-style-type: none"> Polish Civil Engineers graduate from 19 Universities of Technology and from two Academies which have an Agricultural and Technical Profile. Every University is composed of departments (mechanical, civil engineering, architectural, chemistry etc), those of teaching chairs – cathedras or institutes, eg. steel structures, concrete structures, accousties etc). Each has a Departments of Civil Engineering and Environmental or Sanitary Engineering. The organisation of High Schools is regulated by the State Law of Academic Education. About 10,000-20,000 students study at each University of Technology yearly, of which 2,000 are students in the Civil Engineering Department. The basic type of studies are daily studies, no fees, with eleven semesters – five and a half years' duration leading to a graduation diploma and a professional degree of Master in Engineering. The studies are concluded with the diploma - master or engineer thesis - based on structural design or research work and proper examination. In general, about 5,000–6,000 persons graduate as a Master of Science in Civil Engineering yearly in Poland, with an average of 60% effectiveness of studies (pass rate). There are also fully paid engineering „weekend studies" usually supplementary to working technicians, equal to baccalaureate certificate. Lectures, design corrections and laboratories for them are organised on Saturdays and Sundays. Their duration is three and a half to four years, the curriculum is less theoretical, and the graduates obtain a diploma as 'engineer'. This grade is much less popular, counts about 30%, its numbers total to 1,000-1,500 persons yearly. There are doctorate studies at the six main Universities. For these a supplementary of two years over and above a masters education is required. Participants in this level of study must possess outstanding M.Sc. diplomas and must write their doctor's thesis in theory or research during a supplementary two-year period. They receive a state grant and are obliged to fulfil some additional academic work. The legal permission to grant the doctors' diplomas is situated in ten Civil Engineering departments according to number and quality of staff. Assistants are also obliged to write a doctor's thesis within a period of seven years. Those who fail to do so are dismissed from the university. The number of doctorate degrees awarded annually is around 50. The second and highest scientific degree in technology as in social sciences is the habilitated doctor. It is awarded after a special procedure, quality and quantity of publications and a written and registered monograph. Permission to conduct the habilitation² procedure has been legally granted to the ten main Civil Engineering Departments in Poland. Nevertheless, the independent elected Central Commission must accept the habilitation degree awarded by the University for the Scientific Degrees and Scientific Title. The number of persons with accepted habilitation degrees totals ten persons yearly. The highest scientific level is presented by the ordinary professor
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² “Habilitation” is a term used within the university system in some European countries including Poland and Germany. It can be used to describe a qualification, the process of obtaining it or the thesis (in German ‘Habilitationsschrift’) which is part of that process. It is considered a higher level qualification than a Ph.D.

<p>./.. Poland</p>	<p>title, accepted and granted by the same Central Commission after evaluation of research, teaching and publication issues. Approximately ten persons receive this Scientific Title yearly, their average age is 50-60 years old.</p> <p>6. The following professional and scientific grades exist in Poland: - Professional degrees: Engineer, Master of Science in Engineering - Scientific degrees: Doctor of Science in Engineering, Habilitated Doctor in Engineering Sciences, Professor in Engineering Sciences</p> <p>7. The number of obligatory hours during the five years academic course is limited to 1,800. Supplementary 800 hours during the curriculum are designated for diploma work, normally consisting of structural design (architecture, calculation and drawings) executed using computers, or a report of research work. Every year there are competitions at university and all-country level for the best diploma designs.</p> <p>8. It must be stated that about 10% of diplomas are on the highest international level confirmed by the FEANI, SEFI and competition jury statements.</p> <p>The independent Main Council fixes the minimum curricula for Science and Academic Education. All university professors elect their members and their duty is to define and check the quality of education. There is voluntary accreditation of the civil engineering departments, but without the presence of professional associations or industry.</p> <p>This is to be changed during the transformation according to the adaptation of the Polish Legislation to European Union Standards. Professional practice during studies exists, but it is very short - during the inter-semester vacations. There is a system: professional practice comprises geodesy after the first year, a worker's job on a construction site after the second, and management practice after the third year.</p> <p>Environmental training within civil engineering education</p> <p>Three kinds of studies relating to environmental education exist in Polish Universities of Technology:</p> <p>(1) Ordinary studies in Departments of Environmental Engineering or Sanitary Engineering, e.g. in such disciplines as water supply, sewerage, central heating, water treatment.</p> <p>(2) Obligatory subjects type of Environmental Engineering or Environmental Protection in all types of engineering specialities.</p> <p>(3) Undergraduate studies relating to environmental protection directed to different kinds of engineering activity areas.</p> <p>The common interest in environmental protection problems amongst civil engineers is reinforced by Polish Building Law which introduced an obligation to prepare special elaboration related to evaluation of influence of each type of new designed engineering construction on environment.</p> <p>Bologna system of education</p> <p>The Bologna system of education is in progress in Poland. A special State Statute is to be introduced in 2004. The Polish Universities of Technology prefer to introduce two-step studies for civil engineers: four-year or five-year studies after which an 'Engineer' title or 'Master of Science' title in different specialisations is granted when two different paths of studies (Engineer or Master) are separated after the third year of studies.</p> <p>Learning of other languages</p> <p>Learning of other languages is a requirement in order to obtain a civil engineering degree in Polish Universities of Technology.</p>
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<p>Portugal</p>	<p>General education system at present</p>
	<p>After 12 years of education in school, students can apply to a university or to a polytechnic school and enter according to the Numerus Clausus of each University.</p>
	<p>Engineers graduate from a five year University course or from a 3+2 years Polytechnic course. Universities also can give the degree of Master (two years) and PhD (three years).</p>
	<p>There are several public and private engineering universities in Portugal (around 30 courses of civil engineering). The main ones are the public ones, (see annexe at the end of this publication).</p>
	<p>The engineering courses are periodically evaluated by the Ordem dos Engenheiros (OE) and only those approved lead to the automatic admission of students to OE. The students from other courses need to take an examination to enter OE.</p>
	<p>Environmental training within civil engineering education</p>
<p>Modules in environmental understanding are available in Portugal as part of an undergraduate programme in courses approved by OE. They are mandatory.</p>	
<p>Civil engineers are taught about the environmental implications of their work through a mandatory course on environmental impacts in their undergraduate courses.</p>	
<p>Bologna process</p>	
<p>Decisions have not yet been made with regard to the 3+2 system proposed by the Bologna Declaration. At present graduation in civil engineering is upon completion of a five years' course.</p>	
<p>With Bologna it may change to graduation in four years plus one year Master (4+1), or 3+2 which already exists in the polytechnic schools. There are some concerns in relation to changes that have been discussed.</p>	
<p>Learning of other languages within civil engineering courses</p>	
<p>The learning of another language is not a requirement in civil engineering courses but all students know the English language and another language (French or Spanish) from their secondary school education.</p>	

<p>Romania</p>	<p>General education system at present</p> <p>The Romanian higher education in engineering belongs to the “Continental system still present in most European countries, characterized by the existence of two parallel forms of engineering education: of short duration, with a nominal duration of three years, and of long duration, with a nominal duration of five years.</p> <p>Short-duration degree: The short duration programme leads to an engineering degree equivalent to a Bachelor of Science (BSc) degree from the universities in which the Anglo-Saxon or two-tier system is present. In Romania this degree is named :”Inginer colegiu “.</p> <p>Long cycle or ‘Master’ degree: The long education programme is an integrated programme leading straight to an engineering degree equivalent to Master of Science (MSc) degree from the universities in the countries with the two-tier system. In Romania this degree is named “Inginer diplomat”.</p> <p>Under certain circumstances, graduates of the short duration programme can continue the engineering education in the long duration programme.</p> <p>The integrated five-year programmes are offered at the universities as listed in the annexe (Nos. 1-8).</p> <p>The short three-year programmes are offered by University Colleges belonging to the four technical universities (Nos. 1-7) in the annexe.</p> <p>Admission to higher education is open to those who have completed 12 years pre-university education and hold a baccalaureate diploma. The entrance examination is organised by each institution at the beginning of July. A “numerus clausus” system is applied. The number of places is approved by the Ministry of Education, based on the proposals made by each University Senate.</p> <p>The curriculum of the five year programme has two years devoted to general education (basic sciences : mathematics, physics, chemistry, mechanics and subjects such as building materials, strength of materials, surveying, engineering drawing, programming languages, socio-humanities, etc.), followed by one year for engineering sciences (structural analysis, theory of elasticity and plasticity, fluid mechanics, soil mechanics, reinforced concrete etc.) and two years for applied engineering, including the final semester for work on a diploma project.</p> <p>The three year programmes are more oriented toward the practical aspects of civil engineering.</p> <p>In the first year (two semesters), the curriculum is identical for all degree programmes (specialisations) of a given field, prevailing subjects in basic sciences and general engineering disciplines. The second and the third year are devoted to common core engineering subjects and to subjects pertaining to the area of specialisation, including a final project in the sixth semester.</p> <p>Environmental training within Civil Engineering Education</p> <p>Faculties of Hydrotechnics from the Technical University of Civil Engineering Bucharest, University “Politehnica” Timisoara and Technical University “Gheorghe Asachi” Iasi offer a specialisation on “Sanitary Engineering and Environmental Protection” within the five-year integrated programmes.</p> <p>The environmental implication of the civil engineering works are presented in all engineering disciplines, mainly through case studies and emphasis put on the ethical responsibility of civil engineers.</p>
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Romania

Bologna process

Important changes are to be introduced beginning with the academic year 2005/2006, as a result of the Bologna process.

Discussions concerning the introduction of the two-tier system in engineering education in Romania started after the Sorbonne Declaration, at university level or at national level, taking place mainly under the auspices of the National Council of Rectors, and became particularly vivid in the autumn of 2003, when a draft of a "*Law on the organisation of university studies*" became public.

After being adopted by both Chambers of the Parliament of Romania, the Law was promulgated on 24th June 2004, and became valid on the 7th July 2004.

The main provisions of the Law are:

- University studies in Romania are organised in three cycles
- The first cycle, with a duration of three to four years (180-240 ECTS credits) is called "Licenta" (synonym to "Licence" in French). The Law stipulates that for the engineering education the first cycle is of four-year duration. The qualification level acquired by the graduates of the first cycle should be adequate for providing employability.
- The second cycle, with a duration of one to two years (60-120 ECTS credits), called "Master". The cumulated duration of the cycle I, Licence studies, and of the cycle II, Master studies, should correspond to at least 300 ECTS credits or five years. (The Consortium of Technical University in Romania agreed for a duration of one and a half years (90 credits for the second cycle).
- A very important provision of the Law is found in the article stating that for *professions regulated by European norms, recommendations or good practices universities can offer integrated programmes with duration between five and six years, leading to Diplomas equivalent to a Master degree diploma.*
- The third cycle corresponds to doctorate studies and have normally a duration of three years, which in justified cases, (for instance experimental studies) can be extended with one to two additional years, pending the approval of the Senate of the university.
- The existing, short duration three-year programmes are going to be dismantled, unless they can be transformed into programmes corresponding to the *licence level*, an option which is not going to be made in the engineering field where only one kind of first cycle programmes, of four-year duration will be offered.

The provisions of the Law will be applied starting with the academic year 2005/2006.

Learning of other languages

The curricula of both types of degree courses presently offered by universities providing civil engineering education in Romania comprise, in the first two study years, a foreign language course as a compulsory subject.

The number of hours per hours per week and the package of languages from which the students are to choose one are decided by each university. For instance, at the Technical University of Civil Engineering of Bucharest two hours per week are allotted for learning a foreign language. This can be chosen from English, French, German, Spanish, Italian, Russian, and Japanese. A foreign language is also offered at the level of third and fourth study year, but as an optional subject.

<p>Russia</p>	<p>General education system at present</p> <p>Presently there are two parallel systems in higher Engineering Education in Russia:</p> <p>Diploma Engineer (DiplEng) (traditional one) – five or five and a half years' duration (completed Secondary Education – 11 years' study is compulsory) and</p> <p>Bachelor-Academic (BAc) – four years' duration (completed Secondary Education – 11 years' study is compulsory) and</p> <p>Master-Academic (MAc) – two years (BAc or DiplEng Degrees are compulsory).</p> <p>The main aim of the BAc – MAc system is to prepare graduates for scientific, research and education activities with further education on post-graduate courses to prepare their PhD thesis. This is why the number of students, who want and are capable to take this route, is not more than 10% of the whole.</p> <p>Future Educational System: After Russia signed the Bologna Agreement in 2003, it was decided to introduce two-tier system “BEng/MEng system” in addition or instead of DiplEng.</p> <p>It will be the decision of the University and Ministry of Education and Science of RF as to which systems “DiplEng”, “BAc/MAc”, “BEng/MEng”, or indeed all of them, are to exist in either University or Educational Institution. It will depend on educational possibilities of the Educational Body (quality of educational staff, technical equipment (labs, computers), etc).</p> <p>In the two-tier system, the new structure will be 4+1 or 4+2, but for some specialties 5+2.</p> <p>There will be a selection after the first degree, allowing a restricted number of holders of the first degree to continue. It is anticipated that the State will finance Universities' educational expenses: 70% for BEng/BSc (4 years), 20% DiplEng (4+1 years) and 10% MEng (4+2 years).</p> <p>The new system will start in approximately 2007.</p> <p>Environmental training within civil engineering education</p> <p>Environmental training is a part of the undergraduate programme as a special module and is mandatory for all students. The environmental implication of the civil engineering works are also presented in all engineering disciplines, mainly through case studies and emphasis put on the ethical responsibility of civil engineers. A special environmental block is compulsory in the Graduate/Diploma Design, but its volume depends on the speciality (for instance, more detailed for hydrotechnical, ground engineering and water supply and waste water management).</p> <p>Bologna process</p> <p>The new Bachelor's degree (see above) will correspond to the Bologna requirements, being in itself relevant to the job market and will be suitable for mobility.</p> <p>Foreign language learning</p>
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<p>Slovak Republic</p>	<p>General education system at present</p> <p>Slovak civil engineers graduate mainly from three Slovak universities:</p> <ul style="list-style-type: none"> • The Slovak University of Technology in Bratislava, the Faculty of Civil Engineering • The University of Žilina, the Faculty of Civil Engineering • The Technical University of Košice, the Faculty of Civil Engineering <p>There are other faculties in Slovakia partially educating the field of civil engineering.</p> <p>The civil engineering programme aims at the professional training in the field of design and realisation of various types of structures which are important for professional performance in a broad scale of civil engineering. Graduates of the Bachelor degree course are qualified for the position of an assistant in investment, design, realisation and operational teams, in the state and local administration and in the private sector as well as being qualified to undertake the Master's degree course.</p> <p>Graduates of the Master's degree course can find a position as a designer or a building contractor of residential and civil buildings, manufacturing plants, building services, engineering, transportation, water resources and hydraulic structures, and the reconstruction and modernisation of structures.</p> <p>Environmental training within civil engineering education</p> <p>The goal of the Environmental Engineering Programme is to train specialists in environmental structures, environmental engineering of internal and external environment, waste management, landscape and urbanised territories, transport management and the longevity of structures. The programme also includes the environmental sciences, geo-informatics, project and personnel management, programming and automation of engineering and environmental land and commercial law.</p> <p>The graduate is suitable for positions as an executive state administration employee in the field of environmental politics, local administration, environmental protection, water management, engineering networks, waste management and environmental management. Other possibilities include landscape planning designer, environmental structures designer and environmental project manager.</p> <p>Generally, some modules in environmental understanding are mandatory; some are voluntary, depending on the university/faculty/faculty department. However, environmental training is often incorporated in specialised subjects. Furthermore, at the Faculty of Civil Engineering of the Technical University of Košice, students can choose specialisation "Environmental Engineering" that focuses on indoor building environment and outdoor environment of structures. The Faculty of Civil Engineering at the Slovak University of Technology offers the study programme Environmental Engineering.</p> <p>Bologna process</p> <p>The Act No. 131/2002 Coll. of February 21, 2002, on Universities and on Amendment and Supplementation of Certain Laws is in accordance with the Bologna Declaration.</p>
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<p>./.. Slovak Republic</p>	<p>Bachelor study:</p> <p>Depending on the study programme of each university/faculty, the Bachelor Diploma is delivered after three or four years of studies (six or eight semesters) and the state examination. The duration of the architecture and the building construction bachelor studies is four years; the duration of other bachelor studies is three years. The graduate is awarded the title of "Bachelor" (abbreviated Bc).</p> <p>Engineering Study:</p> <p>After five years and the state examination of the "engineering study", the graduate is awarded the academic title of "Engineer" (abbreviated Ing.); in accordance with the Bologna Declaration. The diploma applies as a "Master Graduation".</p> <p>The assessment of studies is based on a credit system (ECTS credits). All universities offer educational modules; some of these modules are mandatory.</p> <p>The Doctoral Study:</p> <p>The graduates of doctoral study in scientific branches are awarded scientific academic title of "philosophiae doctor" (abbreviated PhD). Doctoral study is completed with the thesis defence. The duration of the internal form of study is three years; the duration of the external form of study is five years. The candidate for the PhD must be awarded the Master degree (he/she must have completed five years studies).</p> <p>Foreign language learning</p> <p>Students entering the university are expected to have some knowledge of at least one foreign language, since they have to learn foreign languages starting at elementary school.</p> <p>Depending on the faculty, students can choose to study one or more foreign languages. Usually, one foreign language is a mandatory subject during bachelor degree studies (English, German or French).</p> <p>The Faculty of Civil Engineering of the Slovak University of Technology offers students the possibility to study in English language. Students can learn English during their study with the possibility of taking the final state exam or the TOEFL exam. Furthermore, students have the possibility to learn English, German and French. Classroom instruction includes general conversation, grammar and specialised vocabulary and style appropriate to various civil engineering sub-specialities.</p>
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<p>Slovenia</p>	<p>General education system at present</p> <p>Civil engineering takes place at the universities in Ljubljana and Maribor. Both these universities offer more theoretically oriented university studies and also more practically oriented higher professional studies. After completing their studies, students receive the title univ. dipl. inž. grad. or dipl. inž. grad. respectively. In Ljubljana in the third year of university study it is possible to narrow studies to specialist fields: in Structural Engineering, Hydraulic Engineering, Traffic Engineering, Project Management and Municipal Management. In Maribor it is possible to specialise in Structural Engineering and Municipal Management. Ljubljana offers the possibility to study Water Management and Communal Engineering and a study of Economy Engineering/ specialising in Civil Engineering is possible in Maribor as well. In Ljubljana students of the higher level of professional study can select the same 'narrower' specialisations that are found in the university study course. In Maribor there are two orientations in the higher level of professional study: Structural & Project Management and Traffic & Hydraulic Engineering.</p> <p>The duration of the university studies is four years, higher professional studies last three years. A diploma work (an additional year) is needed to finish the study.</p> <p>Master study in civil engineering lasts two and a half years with a possibility to continue the doctoral study for an additional two years. Direct doctoral study lasts four years.</p> <p>Environmental training within Civil Engineering Education</p> <p>The environmental training is included in the subjects of hydraulic, municipal management, and traffic engineering which are obligatory for all students.</p> <p>Foreign language learning</p> <p>Most civil engineering students have learnt at least two foreign languages in the elementary and secondary schools. In Maribor an English course is obligatory; in Ljubljana, a mandatory course of English is offered.</p>
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<p>Spain</p>	<p>General education system at present</p> <p>Currently the Spanish education system is under revision: at present the structure is as follows:</p> <p>Elementary school start around the age of six, from 1st to 6th grade, followed by four years of Secondary education. These first ten years are compulsory. In order to have access to university studies, another two years of study are needed (1st and 2nd of 'Bachillerato'). English is taught as a mandatory first foreign language from 5th grade in public schools and in Secondary education a second foreign language is optional.</p> <p>In Spain there are private, public and semi-public schools which all offer a standard curriculum to children, as dictated and supervised by the Ministry of Education.</p> <p>The Civil Engineering career in Spain has traditionally been named Ingeniero de Caminos, Canales y Puertos since 1802, year of the establishment of the first Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos in Madrid by Agustín de Betancourt (1758-1824). Until 1957 the Escuela was under the Ministry of Public Works, then it became responsibility of the Ministry of Education. There are currently nine such Escuelas in Spain: Madrid, which counts for more than 55% of all students; Santander; Valencia; Barcelona; Granada; La Coruña; Alfonso X; Ciudad Real and Burgos, all of which are attached to public universities, except for the Alfonso X School which belongs to a private university. All of them, except for the School in Madrid which is structured into a six-year degree, have an academic programme consisting of five years, at the end of which the students have to submit an End of Degree Project, in order to obtain the degree as Ingeniero de Caminos, Canales y Puertos. Furthermore, these teaching institutions are included within the universities framework, being the only institutions allowed to issue a Degree in Ingeniería de Caminos, Canales y Puertos. This degree is the only one that entitles the new engineers to join the Colegio de Ingenieros de Caminos, Canales y Puertos and qualifies them to practice in all the Civil Engineering fields in Spain.</p> <p>The current syllabus of the Degree in Civil Engineering (Ingeniero de Caminos, Canales y Puertos), was approved by the Council of Universities in 1991. The aim of this plan is to form highly qualified engineers, with a solid scientific foundation, which permits lifelong learning and a general perspective in the global environment of Civil Engineering, not only in the purely technical aspects but also in those related to organisational and management aspects. Furthermore, the large number of options allows the student to design his or her own curriculum and thus intensifying their knowledge in a specific field.</p> <p>The Civil Engineering degree is divided into two parts: the first two years make up the First Cycle, and the other three years constitute the Second Cycle.</p> <p>There is also the possibility of gaining direct access to the second cycle from other degrees. Finally the so-called Third Cycle studies lead to the obtaining of the Doctoral Degree in Civil Engineering (Doctor Ingeniero de Caminos, Canales y Puertos). All these three cycles are taught within the Escuelas, and are made up of the equivalent of 300 European Credits (ECTS)</p>
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<p>./. Spain</p>	<p>The First Cycle adopts a fundamentally basic and formative character. The third year is contemplated as a transition from a technical and scientific character towards more fundamental technical and technological aspects which are developed more specifically during the fourth and fifth years.</p> <p>In the First and Second Cycle, the students must choose elective subjects until they have completed the number of credits indicated for each year. Please refer below to the list of different possible options, according to the various Escuelas in Spain.</p> <p>Some Escuelas offer the possibility to their students to follow a lesser number of options, if they carry out other types of activities for which they are awarded equivalent credits. To this end, interested students can be assigned some industry training period opportunities (with a minimum of 60 hours work in a month) in firms and public and private institutions related to Civil Engineering. After completing the five years (first and second cycle) a final 'End of Degree' Project must be presented in order to obtain the title as Civil Engineer in Spain.</p> <p>FIRST YEAR Algebra; Calculus I; Technical Drawing; Applied Physics; Construction Materials; Surveying;</p> <p>SECOND YEAR Calculus II; Structures I; Metric and Descriptive Geometry; Hydraulics and Hydrology I; Geology and Introduction to Geotechnical Engineering; Differential Geometry; General and Applied to Public Works Economics; Mechanics; Transports and Land Use</p> <p>THIRD YEAR Numerical Calculus; Statistics; Structures II; Geotechnical Engineering II; Continuum Mechanics; Calculus III; Materials Science; Hydraulics and Hydrology II</p> <p>FOURTH YEAR Reinforced and Pre-stressed Concrete I; Environmental Engineering; Harbours and Coasts; Roads and Airports; Electrical Engineering; Steel Structures and Combined Construction; Hydraulic Works</p> <p>FIFTH YEAR Projects and Works Organisation and Management; Building and Prefabrication; Transport Engineering; Legislation; Regional and Urban Planning; Business Organisation and Management; History of Civil Engineering; End of Degree Project</p> <p>An incomplete list of optional subjects is available in the various Escuelas:</p> <p>Dynamic Analysis of Structures; Special Foundations; Control and Regulation of Traffic; Structures III; Railways; Technical French; Reinforced and Pre-stressed Concrete II; Environmental Impact of Engineering Works; Maritime Engineering:</p> <p>Nuclear Engineering; Harbour Engineering; Geotechnical Engineering III; Technical English; Advanced Numerical Methods; Dams; Bridges I; Bridges II; Urban Services; Expert Systems; Urbanism II; Management and Operation of Harbours; Computer Aided Design; Optimum Design of Structures; Railways</p>
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<p>./.. Spain</p>	<p>Technical Operation; Underground Hydrology; History of Art; Engineering of Urban Sewage Systems; Materials and Constructive Systems; Rock Mechanics; Decision Taking in Engineering; Urbanism I; Roads and Airports II; Water Resources and Hydraulic Planning; Typology of Structures; Landscape in Engineering; Transport Planning Technical Project; Training Period.</p> <p>Environmental training within civil engineering education</p> <p>There are no mandatory modules in environmental understanding in the undergraduate programme. However, there are some optional subjects related to environment which students can choose. There are subjects on Environmental Impact Studies and the 'End of Degree Project' must include an Environmental Impact Assessment.</p> <p>Bologna process</p> <p>Most recent legislation approved by the Spanish Government in order to adapt to the European Higher Education Area: European Transferrable Credit System (Real Decreto 1125/2003) and more recently, two new laws (Reales Decretos 55/2005 and 56/2005) outlining the basic framework of the three levels: Bachelor, Master and Doctoral:</p> <ul style="list-style-type: none"> - The duration of the undergraduate studies to obtain the Bachelor degree will be four years in all universities plus an estimated six months' period to comply with the 'End of Degree Project'. - This official university degree qualifies the graduate to practice as a professional according to current legislation (Ley de Ordenación de Enseñanzas Técnicas, law that rules the technical aspect of each specific degree) and gives a total of 240 ECTS. - Additionally, the civil engineering graduate can add a second cycle of post graduate studies of one to two years, to obtain a Masters degree and having obtained that or otherwise accumulated a total of 300 ECTS, he/she can initiate the studies to prepare for a Doctors Degree. <p>Foreign language learning</p> <p>English is taught in the Escuelas in the 3rd year. In the pre-university education, English is taught as a mandatory first foreign language from 5th grade in public schools and in Secondary education, a second foreign language is optional.</p>
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<p>Turkey</p>	<p>General education system at present</p> <p>(I) Pre-university education</p> <p>In Turkey, pre-university education can be described as being in two cycles, the first comprises eight years elementary education, the second is a three-year high school education. Entrance age for elementary education is generally six to seven years' old and high school graduation age is generally at the age of 17-18.</p> <p>Elementary education is compulsory. Every Turkish citizen is obliged to have eight years elementary education. High school education of three years is optional in Turkey at present. New laws and regulations are being prepared for a compulsory four-year high school education. All schools in Turkey are under the government of the Ministry of Education.</p> <p>Elementary education in Turkey has a standard curriculum. Elementary schools can differ in the language in which education is provided. Most school educate pupils in Turkish but there are also schools teaching in English, German and French.</p> <p>There are types of high schools in Turkey which have differences in curriculum. Apart from general high schools, there are science schools, occupation schools, public schools offering an intense and qualified education termed generally 'Anatolian high schools', and religious schools. The difference in the types of high school means that the university entrance system applies results differently; some high school types are graded lower or higher accordingly.</p> <p>(II) Engineering education</p> <p>- Engineering education at undergraduate level</p> <p>The Turkish education system has been carrying out a two-tier system with a four year Bachelor degree, followed by two years for a Masters degree.</p> <p>There are 53 public, and 24 private universities in Turkey. Out of a total of 77 universities, 46 universities offer civil engineering education. Two universities (Istanbul Technical University, Yildiz Technical University) have civil engineering faculties, whereas 44 universities have civil engineering departments contained within engineering faculties. There are also vocational schools of higher education where short-term higher education is provided for specific occupations. These offer specific diplomas for technicians, nurses, etc.</p> <p>Some universities combine engineering faculties with architecture, with individual departments existing therein. There are also pre-undergraduate programmes, with a similar degree system to the higher education offered for specific occupations. There are pre-undergraduate departments of civil engineering offering two year courses. By completing a further two years' education, students may complete their four-year regular undergraduate programme, in order to obtain an engineering degree.</p> <p>In order to provide a general view of students and teaching staff numbers in Turkish universities, the following figures have been obtained from research carried out in 2000-2001. At that time there were 1,306,000 undergraduate students, 84,334 graduate students and 86,854 teaching staff in public universities.</p> <p>- Engineering education at post-graduate level</p> <p>-- Master or 'Master-type' programmes</p> <p>Engineering higher education for a Masters' degree involves thesis study within the two-year period allotted; this may be extended if necessary. This remains the main difference between European implementations of master degree without thesis, modified for the five years' period set out in the</p>
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<p>./.. Turkey</p>	<p>Bologna Declaration. The five-year programme as '4+1' has started to be applied without thesis, in parallel to the current engineering education system, which is a fee-paying system. As the '4+1' system offers financial benefits, universities offer the programme according to demand.</p> <p>Referring to the statistics set out in the previous section, the distribution of higher education students is uneven within the universities. Higher education programmes in universities differ from one another; some universities do not provide postgraduate education. Most of the leading universities provide a wide range of postgraduate engineering education, including teaching curriculum and research facilities.</p> <p>When they graduate from the 'first stage' (two year) engineering postgraduate programme, students obtain a Master of Science (MSc) degree, provided that the undergraduate degree is in engineering. It is possible to have postgraduate education in other engineering departments and/or universities, depending on the acceptance criteria. For postgraduate application, all Turkish universities require a minimum grade of LES (Higher Education Examination), differing between universities.</p> <p>The Masters degree in engineering provides students both with an entrance into an academic career and specialisation in related areas. There are also postgraduate programmes where students from engineering undergraduate courses can have a higher degree of another discipline. These programmes do not qualify the students with a Master of Science degree, but provide a higher education diploma.</p> <p>-- Doctorate programmes</p> <p>The second stage of postgraduate degree in engineering in Turkey is the doctorate programmes, whereby students obtain a Doctor of Philosophy qualification upon graduation. Doctorate curricula and programmes differ from university to university, where research on specialised areas is provided.</p> <p>LES grades are required to apply for a doctorate education, as is the case with a Masters degree. The duration of the doctorate programmes is generally two years, which can be extended in relation to research progress.</p> <p>(III) Civil engineering education</p> <p>- Undergraduate education</p> <p>Short description for each type of programme: Civil Engineering education in Turkey has been developing in both qualified technical and academic aspects, and covers all areas of the discipline. The architecture of civil engineering education in Turkey has differences within all universities, but the general outline of Turkish civil engineering education system may be defined as follows:</p> <p>All civil engineering departments have a four-year undergraduate programme, students who complete this successfully are entitled to a "Bachelor of Science in Civil Engineering" degree. Practical experience is generally required for the degree and accordingly, students are required to go into summer practice at the end of their second and third year and to have a satisfactory record of their summer employment approved by the Department. During the fourth year, technical elective courses are offered by most of the universities, to enable the students to advance their knowledge in specific fields. General understanding of the Turkish civil engineering departments leads to separation of Divisions in the last undergraduate year such as; Structural Mechanics, Hydraulics, Foundation Mechanics, Structural Materials, Transportation, Engineering Management. Some universities offer Geodesy, Earthquake Engineering, Environmental Engineering, etc., as separate divisions within the department. These divisions determine the post-graduate specialisations in the department, where students also</p>
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<p>./..</p> <p>Turkey</p>	<p>predetermine their selection in the last undergraduate year.</p> <p>Course credits are based on the weight of the course in the overall curriculum. Basic sciences in first year amount to four credits, main courses in second and third years amount to three credits, main division courses in third and fourth years amount to four credits, technical courses amount to three or four credits respectively. This distribution totals an average of 140 credits, which differs within universities. The above Curriculum was evaluated by the Accreditation Board of Engineering and Technology, Inc.(ABET), taken from Middle East Technical University (METU) as an example of one of three leading civil engineering departments in Turkey. Similar relations with ABET have been applied in other Turkish universities such as Istanbul Technical University (ITU), encouraging further improvements.</p> <p>A credit system in Turkey has been studied recently by research groups in universities, integrated with the European Credit Transfer System (ECTS) which has been started to be applied in several universities. Accreditation and credit systems are among recent studies for university education in Turkey.</p> <p>- Student Admission at undergraduate level</p> <p>Student admission for undergraduate level study falls within the above-mentioned national examination procedure for the general education system. When they graduate from high school, students obtain the right to enter university examinations (ÖSS-Student Selection and Placement Exam) which covers all types of higher education entrance in Turkey. An average number of 1,500,000 sit the university entrance examination which is held annually. From this number, an average number of 200,000 students gain places in universities and departments for four year undergraduate education, evaluated according to the university entrance exam grade. An average of 300,000 students are also placed on short-term 'pre-undergraduate' programmes, vocational programmes, and open education faculty of distance education. Department minimum grade requirements are defined by education criteria integrated with demand on the department, which is implemented and declared by YÖK (Council of Higher Education). YÖK is a governmental institution, which was founded by law, managing and regulating the higher education system in Turkey. This authority is only given to YÖK, and the higher education system in Turkey is independent from the Ministry of Education.</p> <p>- Civil engineering education at post-graduate level</p> <p>Graduate programmes differ from university to university. Some departments offer all divisions of research, whereas some provide a limited range only. Graduate courses are offered in fields of specialisation leading to the degrees of "Master of Science" and "Doctor of Philosophy". The course programme for the MSc degree is decided by the student's advisor according to the student's intended field of specialisation and future career plans. Students are required to take minimum-credit hours from the courses, generally applied as 60 credits, which are approved by the Department. A thesis is obligatory and each student is assigned a thesis supervisor. For studies leading to PhD degree, there are also credit and course criteria for each University. The Masters Degree generally lasts for two years, students may extend this if circumstances require. The PhD degree is framed to a three year programme, although students may also apply for an extension if required. Civil engineering graduate programmes in Turkey provide for the inculcation of state-of-the-art knowledge in applied science and technology and aim to create new and original information in all civil engineering disciplines. Specific attention is attached to national and regional research needs.</p> <p>A number of civil engineering departments in Turkey provide major graduate</p>
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level research activities. Using research facilities and laboratories, department students lead to specific studies on their divisions, also with accordance to international research studies of other universities.

(IV) Recent trends in engineering education in Turkey

The Council of Higher Education (YÖK), founded in 1982, is an institution which determines the basic aspects and regulations of higher education in Turkey. YÖK is a governmental institution, which is governed by a committee, appointed by government. Therefore, the accreditation and education structure studies have been progressing rather slowly, by individual efforts made by universities.

There is no legal accreditation body in Turkey related to university education, but several universities have been collaborating with international research on the subject, as in the case of Middle East Technical University and Istanbul Technical University with ABET. Recently the Engineering Evaluation Committee (MÜDEK) has been respectively studying the accreditation of universities and accrediting universities since 2002. Universities have supported the continuance of this independent committee as it would initiate an overall accreditation system in Turkey. The committee board consists of academic colleagues as well as professional engineers and NGO representatives.

Rectors and deans of universities have been approaching the Bologna Declaration affirmatively, whereas there has not been a determined plan for Turkish implementation progress for further developments. Deans of engineering faculties have been gathering within the name of Engineering Faculty Deans' Council, which is a dynamic and effective formation for the higher education system in Turkey. This Council has been studying international research projects, education-related declarations and agreements, as well as national constraints and action plans. The Council's reaction to the Bologna Declaration has been positive. Strong support, is being expressed. Professor Mustafa Tokyay, Member of Deans Council and Dean of the Engineering Faculty in the Middle East Technical University, has affirmed the Council's intention to study the Bologna Declaration and project Turkish implementations in the 9th meeting, based on decisions made in the 8th Council Meeting held in May 2004, in Izmir. The aim of the study would be to provide a common perspective of all engineering faculties on Declaration applications and the education system. TCCE has been progressing chamber-related studies on the topic, in parallel to university perspectives and research.

Accreditation system drafts and proposals have also been prepared by the Turkish Chamber of Civil Engineers related to recent professional recognition studies as a projection of Turkish civil engineering education.

University departments observe and apply ongoing developments in the profession worldwide. Both national and international relationships between other civil engineering departments are considered essential for most civil engineering education resources in Turkey. Whilst there is room for progress in the education system, the rate of advance is more than promising.

TCCE has been studying international agreements, studies and research projects. Examples of international participation include EUCEET, SEFI, ECCE Education Task Force etc. The Bologna Declaration has been a recent issue to be considered related to professional recognition and accreditation studies. The TCCE reaction to the Declaration is positive, though it must be mentioned that further studies must be carried out on education content and quality. Rough implementations, applications without

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action plans and progress without future projections would be possible causes for system failures. Common platforms for academic and professional engineers must be realised for common studies. Both student profile and Turkey's engineering perspective must be considered in international mutual implementations.

Accreditation system plans and professional recognition studies continue within the chamber. These will form the basis of education system projections. With these perspectives in mind, the TCCE will actively participate in both national and international studies, with the aim of providing solid and efficient practices.

Four year undergraduate education is given in 46 universities: in most of them it is also possible to study for masters and PhD degrees.

(A list of these universities is presented in an Annexe - Addendum 2 - at the end of this publication).

Environmental training as a part of civil engineering education

Environmental understanding is kept as a part of the system since the beginning of civil engineering education in Turkey. The subject has become an individual departmental education, but also continues to be retained within civil engineering training. Environmental understanding modules are provided in undergraduate programmes as related courses.

The mandatory education in civil engineering departments in Turkey consists of environmental understanding, although they may not be dedicated to the issue completely. Most of the universities give the aspect as optional courses.

The environmental implications of civil engineering are given as an essential fundamental of the discipline starting from introductory courses. Structure, hydraulics, geotechnics, management, transportation, geodesy, study of materials and other areas provide the importance of the environmental viewpoint within related courses.

Bologna process

The Turkish education system has been operating a two-tier system comprising four years of bachelor degree followed by two years of master degree. The latter can also be concluded in one or one and a half years. Engineering higher education for a master degree involves thesis study within a two-year period, to be extended if necessary. This remains the main difference between European implementations of a masters degree without thesis, modified for the 5 years in Bologna Declaration. A five year programme as 4+1, has been started to be applied without thesis in parallel to the current engineering education in Turkey, which is a fee-paying system. As there are financial implications in following a 4+1 system, universities offer the programme related to demand. It has been observed that demand on this programme had been rare.

There is no considered new structure for the Turkish education system, as the current structure of 4+2 and 4+1(without thesis) is applicable within the framework of the Bologna Declaration. Considering the high number of engineering students in Turkey graduating every year, it would be possible to have a selection system for second cycle, as being applied currently. 46 civil engineering departments in Turkey accept about 3,000 students, and graduate an average of 2,000 students per year. With respect to the education quality and higher education fundamentals, accepting all

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candidates for a master degree would depend both on the demand and university conditions. Higher demand would lead the system to select qualified candidates according to the cumulative grades, bachelor degree duration and Higher Education Test (LES). LES has been applied in Turkey two times a year, and is mandatory for all master and PhD applications. The acceptance grade of LES differs between universities, as determined within. These criteria are the current selection considerations for higher education in Turkey, and it may be possible that this system will not change in the near future. Considering the 4+1 thesis-free programme, the question of selection of candidates would depend upon an increase in demand. Presently, as demand for this programme can be covered by universities, minimum LES grade is the only requirement for selection.

Graduate Degrees are “civil engineer” for four year bachelor degree, and “civil engineer M.Sc.” for master degree. Considering international relations and national progress in Turkey, a professional recognition system would eventually settle within a programme and accreditation will be improved respectively, based on current accreditation studies. A legalisation process has been started by the European Union Office in Turkey General Secretariat, in which the Turkish Chamber of Civil Engineers is currently involved. This will lead to specific definitions and degree evaluations for graduate civil engineers. The Turkish Chamber of Civil Engineers has been carrying out studies on professional recognition and accreditation, including life-time learning and professional training which have been carried out by the Chamber.

Turkey has signed the Bologna Declaration with the current system. ECTS and Diploma Supplement have been started to be applied in universities as mandatory. Though the content of credit system has been continued to be studied and international implementations have been made with parallel to education research projects, the current engineering education system is applicable relative to Bologna Declaration.

A 4+1 thesis-free system is to be considered as the new system, which will be ongoing in parallel to the current 4+2 system. A default first cycle of four years is to be continued as a four-year study for the ongoing education system. Therefore, there has been no duration-related degree determined for Turkish implementation.

With the implementation of a credit system and Diploma Supplement, the current Bachelor's degree in Turkey is to be considered as suitable for international mobility. A four-year first cycle programme might have differences with international three-year applications from a content point of view, but the duration of the Turkish engineering degree would not change or lessen. Relevance to the job market can be considered for the Turkish system, where further studies have been researched for higher correspondence.

Implementation of ECTS and Diploma Supplement has been mandatory for project involvements such as ERASMUS. Almost all universities in Turkey have introduced ECTS and Diploma Supplement, or will introduce these soon. Respectively, possibilities for mobility are being provided: it must be mentioned that financial inability would affect Turkish mobility internationally. This effect can be expressed as an issue of affordability rather than a legal or institutional one.

As mentioned previously, the Council of Higher Education (YÖK) is a governmental institution, founded by law in 1982, which determines the basic aspects and regulations of higher education in Turkey. Implementation of

<p>./.. Turkey</p>	<p>ECTS was decided by YÖK, and declared to universities.</p> <p>There are no legal defined accreditation agencies in Turkey: universities have been obtaining accreditation with ABET. Recently, the Engineering Evaluation Committee (MÜDEK) has been studying accreditation of universities: it has been accrediting universities since 2002. As mentioned previously, universities have supported the continuance of this independent committee as it would initiate an overall accreditation system in Turkey. The committee board consists of academic colleagues as well as professional engineers and NGO representatives.</p> <p>Rectors and deans of universities have been approaching the Declaration in a positive manner; in contrast a plan has not been determined for Turkish implementation progress for further developments. Apart from the overall perspective for education, specific strategies or firm plans have not been maintained. Deans of engineering faculties have been gathering within the name of the Engineering Faculty Deans Council: this is a dynamic and effective formation for higher education system in Turkey. This Council has been studying international research projects, education related declarations and agreements, as well as national constraints and action plans. The reaction of this council to the Declaration has been positive, and is being strongly supported. Prof. Mustafa Tokyay, Member of Deans Council and Dean of Engineering Faculty in Middle East Technical University, has stated the Council's intention to study the Bologna Declaration and project Turkish implementations in the 9th Meeting (2005), based on the decisions made in the 8th Council Meeting in Izmir in May 2004. The aim of the study would be to provide a common perspective on Declaration applications and education system by all engineering faculties. The TCCE has been progressing chamber related studies on the topic in parallel to university perspectives and research.</p> <p>The Turkish higher education system does not differentiate implementations, as one finds in some Europe implementations. The structure of the Turkish system is generally based on faculties, departments and, in a few cases, institutes. Within this structure, different attitudes and interpretations of the process have not been observed.</p> <p>The reaction of professional organisations to Bologna Declaration progress, can be expressed within the context of the reaction of the Turkish Chamber of Civil Engineers. TCCE has been studying international agreements, studies and research projects. Examples of such international participations are EUCEET, SEFI, ECCE Education Task Force, etc. Specifically, the Bologna Declaration has been a recent issue to be considered, related to professional recognition and accreditation studies. TCCE's reaction to the declaration is positive: it should be mentioned that further studies must be carried out on the content and quality of education. Rough implementations, applications without action plans and progress without future projections would be possible causes for system failures. Common platforms for academic and professional engineers must be realised for common studies. The student profile and engineering perspective of Turkey must be considered in international mutual implementations. TCCE agrees with Turkish academic colleagues on a four-year duration for a bachelor's degree, as the current curriculum would not be applicable in a degree course of three years' duration. Accreditation system plans and professional recognition studies continue within the chamber. This will form the basis of education system projections. With these perspectives in mind, TCCE will actively participate in both national and international studies, with the aim of providing solid and efficient practices.</p>
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Foreign language learning

Most civil engineering departments in Turkey, provide education in Turkish. The Middle East Technical University and Bogazici University give the overall civil engineering education in English, whereas some universities offer specific courses in English as options, in parallel to English grammar courses in these universities. Recently, education language and language learning have been among issues discussed. At present, there are foreign language courses in most universities, but profession-related programmes are provided in the native language.

<p>United Kingdom</p>	<p>General education system at present</p> <p>Civil engineering courses are given at universities across the UK. For 2003, there are courses accredited by the Joint Board of Moderators (JBM) for ICE and IStructE (the Institution of Structural Engineers) at more than 45 universities.</p> <p>In the UK, universities are autonomous bodies and each determines its own admission policy and requirements. Therefore, the entry requirements for civil engineering studies vary, but most universities would ask for a minimum of three A-level exams, including mathematics.</p> <p>Academic qualifications are not national awards, but granted by the individual institutions. Therefore, qualifications and titles may vary between universities. However, most accredited universities usually offer the degrees MEng, given after a 4-year course, or BEng (Hons), given after three years of study. BEng graduates who wish to become Chartered Engineers may do a Matching Section, normally an MSc in Civil Engineering.</p> <p>In addition to courses in Civil Engineering or Structural Engineering, several universities also offer specialised degrees in Civil and Environmental Engineering. At some universities, there are also MEng courses in civil engineering which include a foreign language.</p> <p>Environmental training within civil engineering</p> <p>Environmental engineering modules are now found in most accredited courses, both at BEng and MEng level. Degree courses for which accreditation is sought are expected to contain elements which engage students with the broad range of environmental issues that will later inform and influence their actions as professional engineers. The Joint Board of Moderators (JBM) does not seek to be prescriptive as to how these issues are covered in courses; they might, for example, be the subject of taught classes or could be integrated within project or design work.</p> <p>Bologna process</p> <p>The Bologna process has still had little visibility within the UK. It seemed at first that there was an impression that it would make other European systems similar to the British one, and consequently there was no need to do anything. During 2004, however, there have been more signs of engagement on the part of UK Ministers, with support for the process being balanced by expressions of intent to retain certain elements of the UK system, such as integrated Masters degrees, and a welcome emphasis on outcomes being the key feature of higher education programmes.</p> <p>Foreign language learning</p> <p>Some universities offer MEng degrees which include a foreign language, but it is not obligatory to know a foreign language in order to study civil engineering.</p>
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ECCE's Partner Organisations:

**American Society of Civil Engineers (ASCE) and
Japan Society of Civil Engineers (JSCE)**

COUNTRY	
USA	<p>General education system at present</p> <p>The American Society of Civil Engineers (ASCE's) Board of Direction has acted in recognition of the increased complexity of civil engineering practice, coupled with reductions in credit hours required for graduation. ASCE considers that today's world is fundamentally challenging the way civil engineering is practiced. Understanding and problem-solving is required with regard to the increased complexity of projects in every aspect – from pre-project planning with varied stakeholders to building with minimum environmental and community disturbance. At the same time, reductions in credit hours required for graduation are making the current four year bachelor's degree inadequate formal preparation for a professional civil engineering career. (Please also refer to ASCE's 2001 Report "Engineering the Future of Civil Engineering" – www.asce.org/raisethebar)</p> <p>The problem with credits:</p> <p>Students earn at least 20 fewer credits than did their counterparts in the 1920's. While they take comparable proportions of mathematics, science and general education, today's students complete, on average, 18 fewer credits of engineering topics. That is a whole semester less of technical education at a time when, by almost universal agreement, the complexity of the modern engineering project escalates.</p> <p>There has been slippage in basic technical course requirements within civil engineering sub-disciplines e.g. transportation engineers have not been required to take surveying courses and thus lack basic knowledge in geometrics.</p> <p>Although civil engineering has become increasingly complex in the last 30 years, the technical content of the undergraduate curriculum has not changed substantially during that period.</p> <p>ASCE's actions to redress the deficit</p> <p>ASCE's revised Policy Statement 465, unanimously adopted by the Board of Direction in 2001, states that the Society "... supports the concept of the master's degree or equivalent (MOE) as a prerequisite for licensure and the practice of civil engineering at the professional level". A Task Committee on Academic Prerequisites for Professional Practice (TCAP) formed a Body of Knowledge Committee which was charged with defining the Body of Knowledge (BOK) required to enter the practice of civil engineering at the professional level (licensure) in the 21st century.</p>

<p>./.. USA</p>	<p>Committee recommendations considered</p> <ul style="list-style-type: none"> (i) <u>what</u> should be taught and learned, (ii) <u>how</u> it should be taught and learned and (iii) <u>who</u> should teach and learn it. <p>An outcomes approach was developed towards the 'what' dimension of civil engineering education, building on 11 outcomes drawn up by the Accreditation Board for Engineering and Technology (ABET), adding another four outcomes and prescribing more technical depth and additional breadth.</p> <p>BOK (Body of Knowledge)</p> <p>The 21st century civil engineer must demonstrate:</p> <ol style="list-style-type: none"> 1. ability to apply knowledge of mathematics, science and engineering 2. ability to design and conduct experiments, as well as analyse and interpret data 3. ability to design a system, component or process to meet desired needs 4. ability to function on multi-disciplinary teams 5. ability to identify, formulate and solve engineering problems 6. understanding of professional and ethical responsibility 7. ability to communicate effectively 8. broad education necessary to understand the impact of engineering solutions in a global and societal context 9. recognition of the need for, and an ability to engage in life-long learning 10. knowledge of contemporary issues 11. ability to understand the techniques, skills and modern engineering tools necessary for engineering practice 12. ability to apply knowledge in a specialised area related to civil engineering 13. understanding of the elements of project management, construction, and asset management 14. understanding of business and public policy and administration fundamentals 15. understanding of the role of the leader and leadership principles and attitudes.
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<p>Japan</p>	<p>General education system at present</p> <p>Most Japanese universities, both national and private, offer civil engineering programmes. There are approximately 160 universities and colleges offering civil engineering curricula at present. Different disciplines of civil engineering are offered in different universities and all private universities determine their own programmes.</p> <p>However, many schools offer wide-ranging civil engineering specialisations. Recently, there have been a growing number of schools offering environmental engineering programmes, perhaps in reflection of the social trend. As in any other university programmes, civil engineering programmes generally take 8 full semesters (four years) to complete.</p> <p>Upon successful completion of the required credits, students obtain the Bachelor's degree in engineering. Holders of Bachelor's degree may choose to continue their studies in the Graduate programme (two years Masters of Engineering, followed by three years of Doctoral studies) or they may seek employment within private construction companies, consultants, engineering associations, government or research sector.</p> <p>Junior college and technical high schools</p> <p>In addition to universities, civil engineering curricula are offered by technical colleges and two-year junior colleges. Upon graduation from junior high schools, students may choose to proceed to five-year technical colleges instead of regular high schools. Technical colleges cover the curriculum of a regular high school as well as train the students in the technical fields.</p> <p>Upon completion of the five-year programme, students may continue for two-year advanced course in order to obtain the Bachelor's degree. Likewise, upon completion of two-year junior college programme, students may continue for two more years in the advanced course to obtain the Bachelor's degree. (See attached chart for reference).</p> <p>Environmental programme within civil engineering education</p> <p>Introduction of environment-related courses are left to the decision of individual universities and are not mandatory at present. However, as environmental issues have been attracting wide public attention since the 1970s in Japan, more and more schools are adopting environment-related courses in their civil engineering curricula. In most civil engineering programmes, the first two years (equivalent to the freshman³ and sophomore⁴ years) general education programme includes some mention of environmental topics.</p> <p>In Japan, civil engineering departments are experiencing difficulty attracting students partly due to the negative image of the discipline and the negative image of the name "civil engineering" in Japanese. In order to overcome the difficulty, some universities are introducing more up-to-date programmes such as Civil & Environmental Engineering, or changing the names of their programmes to include "environment" or "social engineering".</p>
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³ first-year student

⁴ a second-year undergraduate (also used of the second year in United States High School or College)

<p>./.. Japan</p>	<p>Bologna process</p> <p>According to “Shaping Our Common Future-An Action Plan for EU-Japan Cooperation” published at the occasion of the EU-Japan Summit in Brussels, in 2001, one of the actions to be pursued at that time was “the establishment of a framework for sustainable mutual cooperation between the EU and Japan in the field of education, focus(sing) on higher education and aim(ing) to facilitate reflection and cross fertilization on education policy and education provision.”</p> <p>Also the Action Plan called for “the reduction of obstacles to the mobility of teachers, administrators and students.” However, at the time of writing (2004), any concrete effort to adapt the Japanese education system to the Bologna system is yet to be seen and the current Japanese higher educational system remains as 4+2+3.</p> <p>Foreign language learning</p> <p>In the Japanese educational system, English has been mandatory starting from the first year of junior high school (grade 7, age 13). Recently, some private as well as public schools began introducing English courses at earlier grades such as 5th or 6th grades (age 11 or 12). In universities, English courses are mandatory in the first two years but not in the last two years (junior and senior years). This also applies to civil engineering majors. At the university-level, some programmes mainly run by national universities are taught entirely in English and the requirements such as exams and papers in English as well.</p> <p>Some private schools require a second foreign language at high school level. Civil engineering majors at universities rarely take a second foreign language:</p>
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CHAPTER 2

STUDENT NUMBERS

Clearly, it is difficult to produce precise statistics for student numbers across member organisations. However, the table below provides a view of undergraduate numbers for civil engineering courses across member countries and also gives an indication of how many students finally succeed in graduating with a civil engineering degree that will enable them to enter the profession.

Members were asked the following two questions:

- 2.1 - How many civil engineering students start in one year?
2.2 - How many civil engineering students graduate in one year?

COUNTRY	No. of students taking up civil engineering courses (approx.)	No. of graduates (approx.)
Croatia	About 700 students enrolled in Croatian faculties of civil engineering in 2003. The figures are similar for technical high schools.	In 2003 approximately 200 students graduated from these Faculties. Again, the figures are similar for technical high schools.
Cyprus	At present the University of Cyprus offers only 25 places each year for civil engineering. There are no records of the number of civil engineering students that commence studies each year. The only existing records from the Government Statistics Service, is the total number of students studying civil engineering and architecture in any year, for all years of study. This number was 660 for the year 2001-2002.	The number of civil engineers who registered with the Technical Chamber of Cyprus was 50, 49 and 68 for the years 2003, 2002 and 2001 respectively. This gives an indication of the number of students graduating each year. There are, however, students who stay to work abroad after graduation.
Czech Republic	3,000 approximately	2,000 graduates
Estonia	Around 400 - 600 students commence civil engineering studies each year.	170 - 195 graduates in one year
Finland	In universities: 220 In polytechnics: 800	Master's Degree: 120 Polytechnics Degree: 500
France		A rough evaluation of Engineers recognised as "Ingénieurs Diplômés de l'Ecole" every year in Civil Engineering is 1,700 (Including Civil Engineer Diplomas delivered to Civil Servants, around 220).

Germany	Total number: 6,100 (2002) (65.5% Fachhochschule, 28 % University, 6.5% Gesamthochschule)	Total number: 5,700 (2002) (60.5% Fachhochschule, 34 % University, 5.5% Gesamthochschule)
Greece	The same number applies to those who start their studies every year.	The number of students graduating each year is: 1,000 (data from 2004).
Hungary	730 (please see annexe for break-down)	550
Ireland	All disciplines, graduates 1,700,	certificates and diplomas 1,700 per annum (2003)
Italy	38,765 students matriculated in the 'laurea' courses of Engineering Faculties, 9,367 of which (24.2% of total) were in the civil and environmental sector. (2002/2003)	6,003 Engineers graduated from three-year courses, (947 of which in civil and environmental sector – 15.8%), 19,283 from five-year courses (5,430 of which in the civil and environmental sector– 28.1%).(2002)
Latvia	RTU : Numbers commencing full-time study courses: in 2003: 240 students; in 2004: 304 students LUA : Numbers commencing full-time study courses: in 2003: 75 students; in 2004: 73 students RTU: Total number of students in FCEB (Faculty of Building and Civil Engineering) is 1,100 students LUA: Total number of students in FRE (Faculty of Rural Engineering) is 280.	RTU: full-time students graduating from degree courses in 2003: 142 students; in 2004: 182 students; LUA: full-time students graduating from degree courses in 2003: 22 students; in 2004: 32 students
Lithuania	In 2003 year around 2,600 students enrolled in University Civil Engineering Faculties and Higher Education Colleges.	In 2003 year around 1,990 students graduated from those Faculties and Colleges.
Poland	8,000 - 10,000 civil engineering students start in one year.	Around 5,000 – 6,000 civil engineering students graduate in one year.
Portugal	Around 1,000 for the 5-year courses and around 400 for the 3-year courses. Approx. 800 for civil engineering courses (2003).	Around 70%. Approx. 500 civil engineering students graduated in 2003.

Romania	About 1,800 civil engineering students commence their studies in one year.	About 1,200 civil engineering students graduate in one year.
Russia	The figure is floating. The number of "budget" students in 16 special Civil Engineering Universities, listed in the appendix is rather constant. In these Universities intake is more than 15,000 students plus approximately 7,000 who are paying for education. Besides there are more than 100 Civil Engineering Faculties in Technical Universities with an average intake from 80 to 120 students. So, about 30,000 students start civil engineering programmes annually.	The graduate figure varies from 70 to 80 per cent from intake figures, approximately 20,000 graduates.
Slovak Republic	Civil engineering faculty at: The Slovak University of Technology 1,000, The Technical University of Košice 420, The University of Žilina 300; in total 1,720 per year.	Civil engineering faculty at: The Slovak University of Technology 520, The Technical University of Košice 140, The University of Žilina 130; in total 790 in one year.
Slovenia	The number of civil engineering students starting in 2004 was 796	The number of civil engineering students graduating in 2004 was 228
Spain	Around 1,500 students commence the Spanish Civil Engineering career (Ingeniero de Caminos, Canales y Puertos)	Approximately 1,200 students graduate each year from the 9 Escuelas de Caminos in Spain.
Turkey	There are 46 civil engineering departments in universities of Turkey presently. 70-100 students start on average per department each year. Thus, an approximate number of 3,500 students commence undergraduate education every year.	The graduate numbers are approximately 60-80 students per department as an average, leading to an average of 3,000 graduated students each year.
United Kingdom	In 2001, the total number of students accepted to courses in engineering and technology was 15,452.	In 2001, the number of students graduating with a degree in engineering and technology was 19,800 (engineers in total).

ECCE's Partner Organisations

American Society of Civil Engineers (ASCE), and Japan Society of Civil Engineers (JSCE)

COUNTRY	<i>No. of students taking up civil engineering courses (approx.)</i>	<i>No. of graduates (approx.)</i>
USA	-	-
Japan	-	Currently, there are approximately 8,000 students graduating from civil engineering departments at universities, including both undergraduate and graduate levels.

CHAPTER 3

RECOGNITION AND PROTECTION OF PROFESSIONAL TITLE

The aim of this chapter is to establish the degree of legal protection offered by each member country to civil engineering qualifications. It is generally considered that protection of title protects the public by limiting the use of these titles to appropriately qualified persons. In some countries protection of title is conferred directly by the state, in others the title may be awarded through an appropriate professional body.

The following two questions were asked of ECCE members.

- 3.1 - *Is there any legislation in your country that obliges you to have a certain qualification in order to carry out the profession of civil engineer?*
- 3.2 - *Is the title of "Civil Engineer" or "Graduate Engineer" or similar, protected under law?*

COUNTRY	
Croatia	<p>Legislation</p> <p>According to the Building Law (passed in 2003), the professionals employed in construction industry must meet formal requirements for the performance of various professional duties. In this respect, formal qualification is combined with the number of years of professional experience.</p> <p>The title "Civil Engineer" or "Graduate Civil Engineer"</p> <p>is protected by law and may be obtained only after completion of high-school studies (for Civil Engineers) or university studies (for Graduate Civil Engineers).</p> <p>All engineers exercising relevant duties in construction (site managers, chief project engineers), design (chief designers, chief project engineers), review/auditing (reviewer), or supervision activities, are required to pass the state examination.</p>
Cyprus	<p>Legislation</p> <p>According to Cyprus legislation, in order to practice as a civil engineer you have to be registered with and be a member of The Cyprus Technical Chamber. To register as a civil engineer one has to hold an approved university degree (after four years' education) plus one year of practical training. Applications for registration are examined by the Cyprus Technical Chamber.</p> <p>Protection of title</p> <p>The title "civil engineer" is protected by law.</p>

<p>Czech Republic</p>	<p>Legislation Only engineers or technicians with the appropriate authorisation issued by the Chamber may use the designations “certified engineer” or “certified technician”.</p> <p>Protection of title Both levels of degree - Master of Science and Bachelor of Science - are protected by law.</p>
<p>Estonia</p>	<p>Legislation At the present time (2003) Bachelor of Science and Master of Science degrees have official recognition and are protected under law.</p> <p>Protection of title “Civil engineer” and “applied engineer” are protected.</p>
<p>Finland</p>	<p>Legislation The Building and Land Use Law states that designers, construction managers, etc. involved in a project should have “the education and experience according to the quality expectations of the project and how demanding it is”.</p> <p>The requirements are specified in the National Building Code of Finland given by the Ministry of the Environment. Minimum requirements of qualification for designers and work managers concerning education and working experience are defined for different levels of projects. The building authorities decide separately in every project whether the persons in charge are qualified.</p> <p>A voluntary professional recognition system headed by The Finnish certification-company FISE Ltd. helps the authorities in this task.</p> <p>Protection of title Only those who have graduated from a University or Polytechnic as M.Sc or B.Sc. are entitled to use the title of “Engineer”.</p>
<p>France</p>	<p>Legislation There is no legislation which requires one to have a specific qualification in order to carry out the Profession of Engineer, thus the title of Civil Engineer is not protected under law.</p> <p>Educational establishments which deliver this recognised Diploma, must have a special Accreditation delivered by a Commission “Commission des Titres d’Ingénieurs (CTI)”.</p> <p>CTI was created by law on 10th July 1934 in order to assess quality of education, then deliver a report to the Ministers in charge of Education Establishments.</p> <p>CTI comprises representatives of Professors, Directors, high level public figures, Industry representatives, Representatives of professional organisations (CTI comprises CNISF representatives).</p> <p>Accreditation is delivered to Engineers High Schools for a maximum period of six years.</p> <p>At European level, CTI is a Member of ESOEPE, the European Standing Observatory for the Engineering Profession and Education.</p> <p>On the other hand, firms can designate some of their employees having demonstrated recognised professional qualification as “Engineers”.</p>

<p>./.. France</p>	<p>Protection of title</p> <p>Only the title of “<i>Ingénieur Diplômé de l’Ecole de</i>”, is very officially recognised, very generally corresponding to graduation from a five-year degree course from either an engineering high school or from the university system.</p> <p>There is no legislation which requires one to have a specific qualification in order to carry out the profession of Engineer, thus the title of Civil Engineer is not protected under law.</p>
<p>Germany</p>	<p>Legislation</p> <p>The title of (civil) engineers is given on request by a government of the Länder (ministry of education/trade and commerce). The education required for this is study at an institution of higher education of at least four years’ duration: this must be completed with the “Dipl. Ing.” awarded by the university.</p> <p>In future civil engineers are awarded a Bachelor Degree which needs up to four years’ education and training time.</p> <p>Protection of title</p> <p>The word “Engineer” is protected by law of the Bundesländer in any word combination. The qualification “Diplom-Ingenieur” (Dip.-Ing./Dipl.-Ing.(FH)) is legally recognised.</p>
<p>Greece</p>	<p>Legislation</p> <p>Law protects both the title of the “Diploma Civil Engineer” and the professional activities in the engineering field. The main legislation refers to</p> <ul style="list-style-type: none"> - The law 4663/1930 - The Presidential Decree referring to the constitution of C.T.G. (the Technical Chamber of Greece), the established institution for engineers. <p>Protection of title</p> <p>According to law 4663/30 Civil Engineers have the right to practise all the activities in the architectural field.</p> <p>For the activities in the engineering field for which a permit is required from a public authority, it is compulsory that a «Diploma Engineer» signs the Studies and Drawings.</p>
<p>Hungary</p>	<p>Legislation</p> <p>Yes, there is legislation.</p> <p>Protection of title</p> <p>Yes, degrees are protected by law in Hungary.</p>
<p>Ireland</p>	<p>Legislation</p> <p>Yes, there is legislation.</p> <p>Protection of title</p> <p>There is protection of title in Ireland.</p>

<p>Italy</p>	<p>Legislation</p> <p>Article 167 of the Royal Decree 31 August 1933, n. 1592 “Testo Unico delle leggi sull’istruzione superiore” (<i>Act on the laws concerning the academic education</i>) provides that any academic title can be awarded only by Universities and by Istituti Superiori (High Level Institutions). As the academic title therefore has a legal value, its abuse is punishable by article 498 of the Codice di Procedura Penale (<i>Code of Criminal Procedure</i>).</p> <p>Protection of professional title</p> <p>According to Dpr.328/2001, Section A and B are created in the ‘Albo Professionale of the Ordine degli Ingegneri’ (<i>Professional Register</i>). Each Section is divided into the following Sectors:</p> <ul style="list-style-type: none"> a) <i>civil and environmental</i>; b) <i>industrial</i>; c) <i>of computer science</i> <p>The members of Section A are entitled to use the following titles, protected by law:</p> <ul style="list-style-type: none"> a) the members of the <i>civil and environmental</i> sector are entitled to use the title of ingegnere civile e ambientale; b) the members of the <i>industrial</i> sector are entitled to use the title of ingegnere industriale; c) the members of the <i>computer science</i> sector are entitled to use the title of ingegnere dell’informazione. <p>The members of Section B are entitled to use the following titles, protected by law:</p> <ul style="list-style-type: none"> a) the members of the <i>civil and environmental</i> sector are entitled to use the title of ingegnere civile e ambientale iunior; b) the members of the <i>industrial</i> sector are entitled to use the title of ingegnere industriale iunior; c) the members of the <i>computer science</i> sector are entitled to use the title of ingegnere dell’informazione. <p>To be enrolled in Section A of the ‘Albo’, it is compulsory to hold a five-year academic title (‘Laurea specialistica’ or ‘Laurea’ of the old academic system) awarded by an Engineering Faculty and to have successfully passed a State Exam.</p> <p>To be enrolled in Section B of the Albo, it is compulsory to hold a three-year academic title (‘Laurea’ or Academic Diploma of the old academic system) awarded by an Engineering Faculty and to have successfully passed a State Exam.</p>
<p>Latvia</p>	<p>Legislation</p> <p>The engineer’s title is given in accordance with the Law on Higher education after graduating from certain study programmes.</p> <p>The education required for this is study at an institution of higher education for a course of at least four years’ duration: this must be completed with the “Būvzinieris (Civil Engineer)” awarded by the professional commission, “Inženierzinātņu bakalaura būvniecībā (Bachelor degree)” or “Inženierzinātņu maģistrs būvniecībā (Master degree)” awarded by the university.</p>

<p>./. Latvia</p>	<p>Protection of title The title “Engineer” is protected by law. The qualification “Būvinženieris” is legally recognised. Diplomas issued by university are officially confirmed by State Emblem⁵. This document (confirming title) like any other, is protected by law.</p>
<p>Lithuania</p>	<p>Legislation Both levels of degrees (Bachelor and Master of Science) have official recognition.</p> <p>Protection of title Both levels of degrees (Bachelor and Master of Science) are protected by law.</p>
<p>Poland</p>	<p>Legislation Yes, there is legislation.</p> <p>Protection of title Yes, degrees are protected by law in Poland.</p>
<p>Portugal</p>	<p>Legislation In order to carry out the profession you must be registered in the Ordem dos Engenheiros</p> <p>Protection of title Degrees are protected by law in Portugal. The title “civil engineer” is protected.</p>
<p>Romania</p>	<p>Legislation Diplomas issued by the Universities to graduates of the five year programmes (engineers) and three-year programmes (engineers - college) entitle the bearers to practice the profession of civil engineer.</p> <p>Protection of title There is no law to protect the title “Civil Engineer” or “Graduate Engineer” nor practice of the profession.</p>
<p>Russia</p>	<p>Legislation To carry out the profession of civil engineer, the Diploma awarded by a Civil Engineering University is needed (five-year training). In special cases, graduates from other Technical Engineering Universities can obtain a civil engineering Diploma after successfully completing a special course in the University. By licensing of the company it is necessary to have a definite number of Diploma Civil Engineers.</p> <p>Protection of title The title “Civil Engineer” is protected by law. Similar to Germany, in future civil engineers are awarded a Bachelor Degree which needs up to four years’ education and training time.</p>

⁵ Only those higher educational establishments which have been accredited and offer state-accredited study programmes have the right to issue certificates of higher education recognised by the state to its graduates.

Slovak Republic	<p>Legislation</p> <p>According to the Act No. 138/1992 Coll. on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations, civil engineers can practise the professional activities in construction only with the authorisation that is issued by the Slovak Chamber of Civil Engineers. The authorised engineers are listed in the Register of Authorised Civil Engineers managed by the chamber. The above mentioned act sets the requirements for becoming an authorised civil engineer in Slovakia.</p> <p>Protection of title</p> <p>The degrees of civil engineers, authorisation, professional qualifications and similar diplomas issued by accredited and recognised institutions are protected by law.</p>
Slovenia	<p>Legislation</p> <p>According to ZGO (Construction Act), the professionals employed in the construction industry must meet formal requirements for the performance of various duties in civil engineering. Formal qualification is combined with the number of years of professional experience.</p> <p>Engineers engaged in construction activities (chief engineers, chief project engineers, those responsible for reviewing or supervision), are requested to pass a special examination.</p> <p>Protection of title</p> <p>The titles “civil engineer” and “graduate engineer” are protected by law and may be obtained only after completion of high-school studies or university studies, respectively.</p>
Spain	<p>Legislation</p> <p>The Royal Decree 1425/1991 of 30 August 1991, establishes the university title of “ingeniero de caminos canales y puertos”. Furthermore, in order to practice as a civil engineer in Spain, it is mandatory to become a member of the Colegio de Ingenieros de Caminos, Canales y Puertos.</p> <p>Protection of title</p> <p>The title is protected by law and only those who have completed the required studies, as laid down in the Law mentioned above, are allowed to use the title of Ingeniero de Caminos, Canales y Puertos.</p> <p>As a matter of fact, if there is a dispute regarding ‘professional intrusion’, the person who holds the specific degree according to which he has studied the subject under dispute, as described to in the above-mentioned law, will win the dispute.</p>
Turkey	<p>Legislation</p> <p>Although the legislation related to civil engineering profession in Turkey has a long history, there are serious shortcomings in many associated issues. Qualification for an engineer following the undergraduate programme is one of the important shortcomings. No legislation is applied for being a qualified engineer in Turkey. Recently, draft work has been produced on this subject, and it is hoped that a law concerning the obligation to qualify after undergraduate education will be achieved.</p>

<p>./. Turkey</p>	<p>Protection of title</p> <p>The Ministry of Prosperity provides laws for the civil engineering profession, but there are defective applications and absences that result in twisted progress in the profession.</p> <p>As a result of these shortcomings in legislation, “graduate engineer” and “civil engineer” titles are legally the same. The Turkish Chamber of Civil Engineers is playing a role to influence the legislation system for the profession and aims to obtain an agreement on recognition and protection.</p>
<p>United Kingdom</p>	<p>Legislation</p> <p>The engineering profession as such is not regulated, anyone may call himself a civil engineer and practice.</p> <p>Protection of title</p> <p>The protected titles in the UK are “Chartered Engineer”, “Incorporated Engineer” and “Engineering Technician”. In order to use these titles, engineers will have to undergo a professional review with one of the licensed engineering institutions in the UK.</p> <p>It is necessary to be a Chartered Engineer in order to carry out certain works, especially in the public sphere.</p> <p>The protected titles are given by the professional institutions under licence from the Engineering Council. The Institution of Civil Engineers carries out the reviews and awards membership and the appropriate title to civil engineers.</p>

ECCE's Partner Organisations,

**American Society of Civil Engineers (ASCE), and the
Japan Society of Civil Engineers (JSCE)**

COUNTRY	
USA	-
Japan	<p>Legislation</p> <p>There is no legislation obliging Japanese civil engineers to have certain qualifications in order to exercise their professions.</p> <p>Protection of title</p> <p>Government-issued qualification of Gijyutsushi (PEJ) may serve as a licence when working as a civil engineer in Japan. There are currently approximately 20,000 PEJs.</p> <p>The JSCE's Civil Engineers' Qualifications (4 grades) are not licences without which engineers cannot exercise, but rather recognition of certain achievements and standards. There are currently approx. 1,000 JSCE qualified engineers but the number is steadily growing as JSCE is developing and propagating the system to be internationally recognised.</p>

CHAPTER 4

TRAINING

Members were asked if a period of professional training (i.e. involving practical work experience) was compulsory as part of undergraduate study. If so, for how long is training required? They were also asked if a training period was required after graduation. In some countries, engineers may practice as professionals immediately after graduation, for others a period of vocational training is required during and after which further reviews are carried out before the individual may be entitled to consider himself as a professional civil engineer, entitled to carry out various construction related activities on an independent basis.

The questions put to members were:

- 4.1 - Is a period of professional training compulsory as part of the undergraduate study? If so, for how long is training required?
and/or
- 4.2 - Is a training period required after graduation?

COUNTRY	
Croatia	<p>Undergraduate training</p> <p>All undergraduate students are required to complete four weeks of practical training at a construction site. This training is organised in the summer months.</p> <p>Postgraduate training</p> <p>After graduation, a well defined training period (practical work) of three to five years is a prerequisite for gaining a licence for independent performance of various construction-related activities.</p> <p>The Building Law also defines training periods needed to obtain the status of a project engineer. Training periods depend on the complexity of work to be performed by an engineer.</p>
Cyprus	<p>Undergraduate training</p> <p>(This depends on which country the student obtained his/her degree in civil engineering).</p> <p>Postgraduate training</p> <p>A period of one year of professional training is required after graduation. There is a proposal to increase this training period to two years.</p>
Czech Republic	<p>Training</p> <p>This is not compulsory at undergraduate or postgraduate level.</p>

<p>Estonia</p>	<p>Undergraduate training</p> <p>During the period of study up to graduation, programmes include practical training in geodesy, engineering geology, and practical experience in construction or design companies.</p> <p>Postgraduate training</p> <p>A training period is not officially required after graduation but some companies and enterprises have their own system of training.</p>
<p>Finland</p>	<p>Undergraduate training</p> <p>In universities, training is compulsory only as a part of undergraduate studies; the minimum requirement is six weeks at construction worker level. Training as an engineer can be accepted as part of the education up to 12 weeks, but is not compulsory.</p> <p>In polytechnics, a compulsory training period is usually seven months, consisting of both engineering training and at worker level.</p> <p>Postgraduate training</p> <p>Training after graduation is not compulsory in order to be qualified, neither with a university degree nor with a polytechnics degree.</p>
<p>France</p>	<p>Undergraduate training</p> <p>During studies, training periods in the professional sector are mandatory. The duration of the training period varies from one to several weeks or months depending on the establishments and depending on the study year involved. In special cases, it could be as long as one year.</p> <p>More and more training periods are to be carried out abroad, sometimes this is mandatory.</p> <p>Postgraduate training</p> <p>No training period is requested after graduation.</p>
<p>Germany</p>	<p>Undergraduate training</p> <p>At technical universities or scientific universities, students do not need to undergo a practical placement.</p> <p>At universities of applied sciences students have to prove they have undertaken a period of practical placement of up to six months before studying. During the study period, there is a full-time practical placement of one semester (often the 5th) and a second one at the end of study (8th semester) to work in and on a problem of the company for the diploma thesis.</p> <p>Postgraduate training</p> <p>In Germany there are no regulations for training after passing the examination at University or Fachhochschule, but there are numerous different independent institutions offering training courses. Such courses are sometimes necessary to award the title of a specialised civil engineer e.g. Prüfenieur or in order to gain a better position.</p>

<p>Greece</p>	<p>Undergraduate training</p> <p>Some courses comprise practical but not professional training. A training period under the supervision of a professional engineer is required only for Technicians (three or four years of studies).</p> <p>Postgraduate training</p> <p>A training period is not required after graduation. After graduation diploma Civil Engineers have to pass examinations organised by the Technical Chamber of Greece in order to become licensed professional engineers.</p>
<p>Hungary</p>	<p>Undergraduate training</p> <p>Not applicable.</p> <p>Postgraduate training</p> <p>A training period is required after graduation. This period varies according to discipline:</p> <ul style="list-style-type: none"> 2 years of practice for MSc (five years' study) consultants 5 years of practice for BSc (three year study-course) consultants 10 years of practice for 'experts'.
<p>Ireland</p>	<p>Undergraduate training</p> <p>Professional training is not compulsory as part of undergraduate study.</p> <p>Postgraduate training</p> <p>A four-year training period is required after graduation.</p>
<p>Italy</p>	<p>Undergraduate training</p> <p>No training period is required by law during the period of academic training or before sitting the State examination.</p> <p>Postgraduate training</p> <p>Since the reform of the educational system, a period of training (compulsory in some cases) by companies or professional societies is generally previewed, both in the Laurea and in the Laurea Specialistica courses. This training generally lasts six months and awards 8/12 formation credits.</p>
<p>Latvia</p>	<p>Undergraduate training</p> <p>According to the Law of higher professional education, all undergraduate students are required to complete 26 to 32 weeks of practical training at a construction site or designing company (consulting engineers). Usually, this training is organised in the summer months. The duration of geodesy practice in university (1st year) amounts to two weeks.</p> <p>Postgraduate training</p> <p>After graduation, a well defined training period (practical work) of three to five (eight) years is a prerequisite for gaining Certificate for independent performance of various construction related activities. The training periods needed to obtain the Certificate is defined by Certification conditions issued by LatACE BSSI (Civil Engineers Certification Institution). Certification procedure is defined by regulation Nr. 383 of Cabinet of Ministers. Training periods necessary for successful certification depend on the complexity of the work to be performed by an engineer.</p>

<p>Lithuania</p>	<p>Undergraduate training</p> <p>During the period of undergraduate study, education programmes include three types of practical training:</p> <ul style="list-style-type: none"> ▪ 2 weeks of practice in geodesy ▪ 1 week of practice in engineering geology ▪ 5 weeks of practice in construction or design companies. <p>Postgraduate training</p> <p>There is no organised system of training of graduates except that some independent companies have their own system of training.</p>
<p>Poland</p>	<p>Undergraduate training</p> <p>A period of professional training is compulsory as part of the undergraduate study.</p> <p>Postgraduate training</p> <p>Training is required for a minimum period of 2x1 months up to a maximum period of 4x1 months after each academic year.</p>
<p>Portugal</p>	<p>Undergraduate training</p> <p>A training period is required after graduation to become a full engineer, but even without training (as "training" engineer), the members can carry out small engineering works by themselves.</p> <p>Postgraduate training</p> <p>Six months training is required under the supervision of an older member (Supervisor) of OE. This is organised by OE and includes a short course on Professional Ethics and Responsibility. After the approval of the training, the student can be registered in the Ordem dos Engenheiros as a full member.</p>
<p>Romania</p>	<p>Undergraduate training</p> <p>Training is provided as part of the undergraduate course.</p> <p>Two periods of training of one month duration each are provided in the curriculum of five-year degree courses, in the summers following the second and the fourth study year.</p> <p>Post-graduate training</p> <p>There is no organised system for the training of civil engineering graduates because there is no system of professional registration to require it. A university diploma is also a licence for professional work.</p> <p>Although there is no organised system, some public administrations or autonomous organisations have their own system for the training of young engineers in the first two to three years of their career.</p> <p>Also, various types of continuing education and professional development are organised.</p>
<p>Russia</p>	<p>Undergraduate training</p> <p>During the period of study up to graduation, education programmes, as required by the State Educational Standard, include practical training in introduction to a specialist subject (1 week), geodesy (2 weeks), engineering</p>

<p>./. Russia</p>	<p>geology (1 week), computer/informatics (2 weeks), construction machines (1 week) and practical experience in construction or design companies (16 weeks). All practical training is organised in the summer period.</p> <p>Postgraduate training</p> <p>A training period is not officially required after graduation but some companies and enterprises have their own system of training. Besides there are special institutions (including Universities), providing continuous professional development. The certificates relating to such training are necessary for getting licences for special works or to gain a better position.</p>
<p>Slovak Republic</p>	<p>Undergraduate training</p> <p>Professional training is a compulsory part of the undergraduate study. The length of the training depends on the study programme (e.g. 2 month).</p> <p>Postgraduate training</p> <p>In the Slovak Republic there are strict regulations for training. Certain professions require not only degrees, but also a Certificate of respective training. After this qualification confirmed by University/the faculty of civil engineering, and the Slovak Chamber of Civil Engineers, civil engineers may act as e. g. Authorised Engineer, Site Manager, Design Consultant, and so on. For applying into practice, there are various regulations determined for individual organisations.</p>
<p>Slovenia</p>	<p>Undergraduate training</p> <p>All undergraduate students have to complete 22 weeks (over a period of three years) of practical training at a construction site as part of the educational process.</p> <p>Graduate students have to complete one month of practical training over a four-year period.</p> <p>Postgraduate training</p> <p>One year of professional training is required after graduation. An additional two years are a prerequisite for gaining a licence for independent work on various construction related activities (special exam at IZS-MSG).</p>
<p>Spain</p>	<p>Training</p> <p>A period of professional training is not compulsory either at undergraduate or at postgraduate level.</p> <p>However, it is optional and usually the Escuelas have signed agreements with construction companies and the students will have access to training periods which mostly take place during the last two years of the undergraduate study course.</p>
<p>Turkey</p>	<p>Undergraduate training</p> <p>Training is only mandatory during undergraduate education. Field and office training is requested for an average of 45 days each in all Civil Engineering departments.</p> <p>Postgraduate training</p> <p>Training after graduation is not applied in Turkey, and to cover the effects of this lack, there is an emphasis on essential undergraduate training.</p>

<p>United Kingdom</p>	<p>Undergraduate training</p> <p>A period of professional training is not compulsory as part of the undergraduate study. However, some training may take place, for example during sandwich courses or as part-time study.</p> <p>Postgraduate training</p> <p>The route to membership of the Engineering Council UK requires a continuum of education, training and personal development, which builds upon the educational base. This period of development ideally includes a formal structured training scheme but it can be achieved without it. The training period must be formally assessed before the candidate may proceed to the next stage. A training period typically lasts between three to six years.</p>
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ECCE's Partner Organisations

American Society of Civil Engineers (ASCE), and Japan Society of Civil Engineers (JSCE)

<i>COUNTRY</i>	
USA	-
Japan	<p>Undergraduate training</p> <p>A period of professional training is not compulsory as a part of undergraduate programme but most universities now offer internship as an option. This is perhaps in reflection of the difficulty for recent graduates to enter the job market. Universities tap the alumni connection in order to find companies that would accept their students as interns.</p> <p>Postgraduate training</p> <p>A training period after graduation is not mandatory but most companies, whether construction companies or consultants, provide a training period of a couple of months to employees fresh out of university.</p>

CHAPTER 5

SERVICES OFFERED BY PROFESSIONAL CIVIL ENGINEERS

The aim of the question was to ascertain the degree of diversity in the civil engineering role – also to discover if there are any exceptions for which special approvals or specialist education is required.

The question asked of ECCE member organisations was

5. *What services may be offered by civil engineers in your country?*

COUNTRY	
Croatia	<p>The following services are provided by civil engineers :</p> <ul style="list-style-type: none"> • design services for infrastructure projects (roads, railways, water supply, sewerage schemes, water treatment plants, hydroelectric power plants, dams, etc.), • design services (only for the civil engineering portion of design work for buildings, such as structural design, organisation of work, material and work specifications, conceptual and detailed structural drawings, etc.), • supervision (inspection) services during realisation of works, • project control to check fulfilment of essential project requirements, in accordance with the Construction Product Directive (Directive 89/106/EEC), • construction services in building and engineering works, • use and production of raw materials, and material testing services, • maintenance of completed projects, • scientific research in the field of civil engineering. <p>They may be self-employed, employed in design offices, or employed in other types of companies.</p> <p>Civil engineers are not allowed to offer architectural design services.</p>
Cyprus	<p>Civil engineers can offer various services for civil engineering works including feasibility studies, civil engineering designs, structural designs, preparation of tender/contract documents, procurement, supervision of construction works, etc. Civil engineers who have registered before 1993 can also carry out architectural designs and submit them for building permits.</p> <p>Civil engineers who registered after 1993 are not permitted to submit architectural designs. There is, however, a dispute as to what 'architectural design work' is.</p>
Czech Republic	<p>Civil engineers can undertake the design, development, supervision and execution of all forms of construction.</p> <p>Selected activities in construction, which are of decisive significance for the protection of public interest, in the preparation, design, or execution of construction work may be performed only by persons who have a proven professional qualification obtained by examination and a professional certificate.</p>

Estonia	A wide range of services may be offered by civil engineers after graduation in the fields of construction, design and maintenance of buildings and structures.
Finland	<p>The education of civil engineers covers the whole civil engineering scope, which includes Bridge Engineering, Building Materials Technology, Construction Economics and Management, Environmental Protection, Highway Engineering, Transportation Engineering, Soil Mechanics and Foundation Engineering, Steel Structures, Structural Engineering and Building Physics, Structural Mechanics, Water Resources and Water and Wastewater Engineering.</p> <p>The civil engineering profession includes many types of services: design, planning, expert evaluation, contracting, supervision, project management, real estate management, legislation, factory production management, client consulting, R&D, quality assurance, education and training, etc.</p>
France	<p>Civil Engineers are involved in all steps of the construction process, so they offer their services in the main following phases:</p> <ul style="list-style-type: none"> - preliminary plans of works, - materials production, - design of works, - construction processes on job sites, - quality control of works carried out, - operation of works after construction. <p>They also operate at any functional or operational levels in industry and in public authorities.</p>
Germany	<p>There is a wide range of possibilities of services in Germany, for example: Services related to civil engineering works and transportation facilities, traffic planning services, services relating to buildings, open-air facilities, project control, experts' reports and valuations, town planning services, services relating to planning load-bearing structures, services relating to thermal building physics, services relating to sound insulation and acoustics, services relating to soil mechanics, earthworks and foundation engineering;</p> <p>Prüfingenieur (engineer for statics, state approved specialist after special examination).</p>
Greece	<p>Civil engineering services cover the full development of projects, the supervision and the execution of all kinds of buildings and civil engineering works (bridges, roads, railways, ports, airports, hydraulic plans, etc.).</p> <p>In private contracts, mainly dealing with building works, the civil engineer can design and supervise the works and can also be the construction contractor. In other cases it is also common that a civil engineer design and supervise only the structural part of the building.</p> <p>In public contracts civil engineers can provide design and consulting services in all fields of civil engineering defined by the law 716/1977 and the subsequent law 3316/2005 which conforms to Directive 18/2004. Civil engineers can also provide construction services acting as contracting firms defined by the law 1418/1985 and the subsequent amendments L.2940/2001 and L.3263/2004, Contracting firms are obliged to have in their directing bodies a certain number of engineers depending on the size and capacity of the firm.</p>

<p>.I. Greece</p>	<p>Civil engineers are employed by Public management services as Head of Departments.</p> <p>Civil engineers also provide their services in the industrial field mainly dealing with construction materials and some of them run such industries.</p>
<p>Hungary</p>	<p>The education of civil engineers covers the whole scope of the civil engineering practice, so in Hungary civil engineers may operate in consultancy, planning, expertise, as building managers, investor advisors or in public authorities.</p>
<p>Ireland</p>	<p>In Ireland, civil engineers may offer all services. The title of Chartered engineer is protected by law.</p> <p>Civil engineers are allowed to submit “architectural” designs for building permits.</p>
<p>Italy</p>	<p>The professional competences of the Members of the Albo are provided by law and are “reserved”.</p> <p>The Royal Decree Regio Decreto n. 2537/1925 and the D.P.R. 328/200 provide that the following competences are reserved to civil and environmental engineers (Section A of the Albo):</p> <ol style="list-style-type: none"> 1) planning, design, development, directing works, evaluation testing, management, evaluation of the environmental impact of the built works and structures, transport and territorial infrastructures, works to safeguard soil and the depollution and the cleaning up, geotechnical works, of civil plants and systems and relevant to environment and territory; 2) activities implying the use of advanced, innovative or experimental methodologies in designs, directing works, evaluation and testing of structures, systems and complex, innovative processes; 3) design, management and evaluation relevant to works to win, transform and use materials directly or indirectly necessary to the constructions and industries, of the works relevant to ways and means of transport, to communication and downflow, to construction of any kind, to machinery and industrial plants, as well as, in general, to the application of physics, geometrical surveys and esteem. <p>The D.P.R. 328/2001 provides that the following competences are reserved to civil and environmental junior engineers (Section B of the Albo):</p> <ol style="list-style-type: none"> 1. activities based on the application of science to contribute and cooperate to the activities of designing, working direction, evaluation and testing of the built works, public works included; 2. designing, directing works, supervision, accountancy, and liquidation of simple civil constructions, using standardised methodologies; 3. direct or instrumental survey of modern and historical buildings and geometrical survey of any kind.
<p>Latvia</p>	<p>There is a wide range of possibilities of services in the areas of construction offered after graduation from university:</p> <ul style="list-style-type: none"> • planning and designing works • construction works on site • supervision of construction works • building materials production • surveying • building maintenance • traffic management and road safety

Lithuania	After graduation from university, there is a wide range of possibilities of services in the areas of construction, design and maintenance of buildings and structures.
Poland	The services that may be offered in Poland are: designing, building management, technological supervising, technical consulting, providing expertise and teaching.
Portugal	<p>The services offered by Civil Engineers are defined by law but only relating to design.</p> <p>A civil engineer may offer any service in the Construction sector. For example, design of structures, urban planning, hydraulics, geotechnics, construction management, etc.</p> <p>Civil Engineers are still allowed to submit "architectural" designs for building permits, but only for small buildings. This will change in the near future.</p>
Romania	<p>Civil engineering services offered cover a wide range of activities such as:</p> <ul style="list-style-type: none"> - drafting of projects (design) - construction works - supervision of construction - quality control - testing etc. <p>for all kinds of building and civil engineering work.</p>
Russia	<p>The following services are provided by civil engineers :</p> <ul style="list-style-type: none"> • design services for infrastructure projects (roads, railways, water supply, sewerage schemes, water treatment plants, hydroelectric power plants, dams, etc.), • design services (only for the civil engineering portion of design work for buildings, such as structural design, organisation of work, material and work specifications, conceptual and detailed structural drawings, etc.), • supervision (inspection) services during realisation of works, • project control to check fulfilment of essential project requirements, in accordance with the Construction Norms and Rules (SNIP), • construction services in building and engineering works, • usage and production of raw materials, and material testing services, • maintenance of completed projects, • scientific research in the field of civil engineering. <p>They may be self-employed, employed in design offices, or employed in other types of companies.</p> <p>Civil engineers are not allowed to offer architectural design services.</p>
Slovak Republic	Civil engineers perform complex activities in design, territorial development planning and design, project management, research and development, activities of site manager as well as other services. They are also involved in the fields of public and state administration, education, rural development in all kinds of services, surveying and many other areas.

<p>./. Slovak Republic</p>	<p>For selected activities they must have authorisation, i.e. proof of qualification – certificate issued by the Slovak Chamber of Civil Engineers (after passing the exam in front of the Board of Examiners) according to the Act No 138/1992 on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations.</p>
<p>Slovenia</p>	<p>There is a wide range of complex services for civil engineering works, among others, research and feasibility studies, civil engineering designs, preparation of tender and contract documents, procurement, supervision, construction and maintenance of all form of structures.</p> <p>They are involved in public and state administration and education process.</p>
<p>Spain</p>	<p>Spanish civil engineers are involved in all steps of the construction process as well as in a wide range of other services:</p> <p>Design services for and construction of infrastructure projects, supervision and maintenance, roads, ports, airports, railways, water resources, water and waste water engineering, power plants: hydro electrical, thermal, nuclear and others; dams etc.</p> <ul style="list-style-type: none"> - Town and country planning, - Finance, - Management, - Insurance, - Teaching, - Scientific research. <p>It should be mentioned that in Spain civil engineers are not allowed to design dwellings; however, they are allowed to make the structural calculations. As a matter of fact, most often architects ask civil engineers to present the calculations for larger building structures in dwelling design projects.</p>
<p>Turkey</p>	<p>The civil engineering sector in Turkey has a very wide range of implementations. A graduate civil engineer can study as an academic in universities, or become an engineer in either the public sector or private sector. All divisions of civil engineering are considered, researched and applied in Turkey. Civil engineers who have graduated from university provide services as designers, implementation engineers, contractors, subcontractors, consultants, control engineer, materials engineer, researcher, etc.</p> <p>Considering the distribution of civil engineers to these services, there are mostly implementation engineers, followed by control engineers most of whom are in the public sector. The weights of other services are distributed almost equally in between.</p>
<p>United Kingdom</p>	<p>Civil engineers can undertake the development, design, supervision and execution of all forms of construction, both in public and private work.</p> <p>For some types of work, e.g. the construction of dams or to work as an independent building inspector, a special authorisation is needed.</p>

CHAPTER 6

NUMBERS OF QUALIFIED ENGINEERS

The responses to this chapter must be considered to be indicative. Construction plays a major part in national economies in all member countries. In some member countries it is impossible to obtain data for historical reasons and in others, national statistics group all engineering professionals together.

The questions asked of members were as follows:

- 6.1 - How many qualified engineers are there in your country at present?
(If you are providing figures, please specify the date these figures were produced).
- 6.2 - If at all possible, please provide figures according to the categories you use in your country.

COUNTRY	Number of Qualified Engineers at present (approx.)	Categories of Qualified Engineers (approx.)
Croatia	The total number of qualified graduate civil engineers is estimated at 5,000, and the number of civil engineers is 4,200, although these are rough estimates only as there are no official statistics.	As stated, there are no official statistics available. The information provided is in fact based on the number of persons employed in the construction industry and complementary industries in the year 2002 (according to 2001 census, Croatia had 4.2 million inhabitants).
Cyprus	The number of qualified and registered civil engineers in Cyprus is 2,200 (year 2004)	
Czech Republic	The number of qualified engineers is about 90,000 in total.	The number of qualified engineers is about 40,000 at Master level and 50,000 of the other levels.
Estonia	Data on the total number of qualified engineers is not available because until 1991-1992 there was no register of civil engineers. At the same time there were some hundreds of civil engineers in Estonia who had been graduated from colleges of further education of other republics of the Soviet Union.	Not applicable (see previous related response).
Finland	Engineers with a degree in Civil Engineering (MSc and Polytechnic/BSc degree) total approximately 18,000 (2004).	Engineers with MSc degree: 5,300 Engineers with Polytechnic Degree/ BSc degree: 12,600 (2004)

France	A rough evaluation of Civil Engineers acting in the private sector is around 70,000.	Civil Engineers involved as civil servants in central and local public authorities are around 8,000.
Germany	There are approximately 1,000,000 engineers of all disciplines.	40,000 civil engineers are registered in the Chambers of Engineers. Another 30,000 are members of different professional associations such as VDI, ZDI, etc.
Greece	In March 2005, there are 25,000 fully qualified professional Civil Engineers, members of the Technical Chamber. Almost 57% of them work in Athens, 10% in Salonica and the rest all over Greece.	
Hungary	The estimated figure is around 20,000 to 25,000	Data is not available.
Ireland	Around 60,000 is the estimated figure.	For national categories please refer to the web-site and national census figures on www.irlgov.ie and www.cso.ie
Italy	We may estimate that in 2003 about 285,000 engineers are professionally active in Italy, mostly as employees. Almost 165,000 engineers are enrolled in the Albo, less than 1,000 of which are 'iuniores' (junior) engineers (Section B).	Almost all engineers pursuing the liberal profession, operate in the civil sector either on a part-time or full-time basis.
Latvia	Total number of civil engineers 4,600; certified engineers 2,000 (Not certified engineers 2,600)	Certified engineers are listed in a register. The down-side of this system is, that Dr.sc. degree, special experience and knowledge is not taken into account. Recently LatACE has worked out and introduced a more detailed grading qualification system of engineers: III ... I categories and a higher category. In this system practical experience, degree qualification and the engineer's, special knowledge will be taken into account.
Lithuania	Data is not currently available.	
Poland	In 2002, there were approximately 2,900,000 engineers of all disciplines in Poland.	In 2002, approx. 200,000 civil engineers, including 95,000 civil engineers registered in the Polish Chamber of Civil Engineers

Portugal	Around 50,000 engineers (2003).	Approximately 12,800 civil engineers are registered at the Ordem dos Engenheiros.
Romania	Presently there are about 43,000 civil engineers and 14,500 civil engineers - college.	Presently there are about 43,000 civil engineers and 14,500 civil engineers - college.
Russia	There are no official statistics.	There are no official statistics.
Slovak Republic	The number of qualified civil engineers is estimated approximately to 25,000 (2004). The number of authorised civil engineers is 4,455 (01.03.2005).	The data regarding the number of qualified civil engineers according to categories is not available. Aurhorised civil engineers are divided into the following basic categories: A) Complex Architectonic and Engineering Services: 1. Building Constructions (654) 2. Engineering Constructions (1315) B) Professional Activities in Construction: 3. Statics of Buildings (680) 4. Engineering Structures (999) 5. Technical, Technological, and Energetic Equipment of Buildings (2807) (01.03.2005)
Slovenia	Unfortunately, no official statistics exist.	As an indication of numbers we may advise that 2,255 Civil engineers are registered in the IZS – MSG . A further breakdown by field of activity is not currently available.
Spain	Around 19,000 practicing civil engineers in Spain	All of the 19,000 civil engineers are considered as 'qualified' without dividing into any further categories.
Turkey	As the "qualified engineer" concept has not been officially used in Turkey yet, the number of civil engineers is provided hereby. By 2003, there were about 80,000 civil engineers in Turkey. 64,000 of these engineers are members of TCCE, which is a remarkable rate for the country.	The "qualified engineer" concept has not been officially used in Turkey yet.

<p>United Kingdom</p>	<p>70,000. The figures give the number of engineers registered with the Engineering Council (U.K.) by the end of 2003.</p> <p>According to the Engineering Council's own studies, the number of registered engineers accounts for 38.5% of the total number of graduate engineers in employment in the UK (although not all graduate engineers practice engineering).</p>	<p>The figures for civil engineers show the current number of registered engineers who are members of the Institution of Civil Engineers.</p> <p>Chartered Engineers: 190,402 (of which 46,415 are civil engineers)</p> <p>Incorporated Engineers: 45,192 (of which 3,108 are civil engineers)</p> <p>Engineering Technicians: 12,824 (of which 584 are civil engineers)</p> <p>It is worth noting that the percentage of registered women is low, only 3.2% of all Chartered Engineers, 1% of Incorporated Engineers and 1.2% of Engineering Technicians.</p>
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CHAPTER 7

PROFESSIONAL ORGANISATION AND REGISTRATION

This chapter aims to present a picture of the scale of professional organisation in each member country – also to indicate if an official national Register is maintained of qualified professional civil engineers.

The questions asked of member organisations were as follows:

- 7.1 - *Are civil engineers obliged to register (e.g. with a state organisation or Chamber of Engineers) in your country?*
- 7.2 - *Are there voluntary professional organisations for civil engineers? What are they called, and which types of civil engineers do they represent (e.g. contractors, consultants, structural engineers)?*
- 7.3 - *Is your association permitted to have any interest in the commercial interests of its members?*
- 7.4 - *Are there professional sectoral societies in particular fields/specialisations (e.g. concrete, geotechnic)?*

COUNTRY	
Croatia	<p>Registration</p> <p>Only engineers wishing to obtain licence for the design, supervision and project control are obliged to be members of the Chamber - Chapter of civil Engineers.</p> <p>Voluntary membership of professional organisations</p> <p>Membership in professional associations or societies is voluntary. These societies represent different fields of civil engineering profession such as structural engineering, road/motorway/railway engineering, dam engineering, water engineering, project management, etc. Usually, members constitute a mix of designers, contractors, consultants and civil servants.</p> <p>Relationship to commercial interests of members</p> <p>The Chamber - Chapter of Civil Engineers does not interfere with the commercial interests of its members. The membership fee in the Chamber is equal for all members, and covers the Chamber's operating costs and professional liability insurance payments.</p>
Cyprus	<p>Registration</p> <p>Civil engineers are obliged to register with the Cyprus Technical Chamber.</p> <p>Voluntary membership of professional organisations</p> <p>There are two main civil engineering professional organisations:</p> <p>(a) Cyprus Association of Civil Engineers (CYACE)</p> <p>(b) Civil Engineers and Architects Association (CEAA)</p> <p>Members of CYACE are civil engineers who are registered with the Cyprus Technical Chamber.</p> <p>Members of CEAA are civil engineers and architects registered with the Cyprus Technical Chamber.</p>

<p>./. Cyprus</p>	<p>Commercial interest in members activities</p> <p>Though the main purpose of CYACE and CEAA is to promote the continuous Professional Development of their members, they show interest in the “commercial” interests of their members.</p> <p>There is also a “Consultants Association”, members of which are civil engineering and architectural design offices.</p> <p>Professional sectoral societies</p> <p>There are no professional sectoral societies but there are “specialised committees” within CYACE and CEAA.</p>
<p>Czech Republic</p>	<p>Registration</p> <p>Yes, there is a system of registration in the Czech Republic. The Czech Chamber of Certified Engineers and Technicians is the recognised qualifying body and registration point for the profession of civil engineering and has a status equivalent to other state organisations by law. The Chamber was founded in 1992, with about 21,000 engineers and technicians being members at the present time.</p> <p>Voluntary membership of professional organisations</p> <p>The Czech Institution of Structural and Civil Engineers, founded in 1865. It is a technical society with about 2,500 individual members, who have at least a Master of Science degree in civil engineering. Membership is voluntary.</p> <p>The Czech Association of Consulting Engineers is an association of independent consulting companies. This organisation is full member of FIDIC and EFCA.</p> <p>There are also the Community of Architects, the Czech Chamber of Certified Architects, the Czech union of Scientific and Technological Societies and the Union of Building Entrepreneurs of the Czech republic.</p> <p>Commercial interest in members’ activities</p> <p>No, this is not permitted.</p> <p>Professional sectoral societies</p> <p>The Czech Geotechnical Society; The Czech Concrete Society; The Czech Constructional Steelwork Association and others.</p>
<p>Estonia</p>	<p>Registration</p> <p>Civil Engineers are obliged to register at the Ministry of Economy and Communication of Estonia if they start to work as entrepreneurs or responsible engineers.</p> <p>Voluntary membership of professional organisations</p> <p>The structure of voluntary professional organisations for civil engineers is as follows: The Estonian Association of Civil Engineers (EEL) was established in 1991. It is a voluntary and non-profit association for civil engineers.</p> <p>EEL has two associated members: the Estonian Society of Heating and Ventilation Engineers (EKVÜ) and the Estonian Geo-technical Society (EGÜ).</p> <p>Relationship to commercial interests of members</p> <p>Our association is a non-profit and voluntary association for civil engineers and not permitted to have interest in the commercial interests of its members.</p>

<p>./.. Estonia</p>	<p>Professional sectoral societies in particular fields/specialisations</p> <p>There are a number of other voluntary professional sectoral societies in Estonia: the Estonian Association of Architectural and Consulting Engineering Companies, the Estonian Association of Construction Entrepreneurs, the Association of Construction Material Producers of Estonia, the Estonian Society of Steel Constructions, etc.</p>
<p>Finland</p>	<p>Registration</p> <p>There is no law requiring Civil Engineers to register. A voluntarily based certification system exists (Organisation for Certification of Professionals, FISE), founded in 2002. The certification system has an “unofficial” support from the authorities, since it aims to secure the competence of the professionals and thus lead to a better built environment. The Certificate application process is in two-stages: first the application is checked by an advisory board and is followed finally by acceptance (or rejection) by the certification board.</p> <p>Voluntary membership of professional organisations</p> <p>There are separate organisations for different educational levels i.e. technicians have their own association, engineers holding BSc degrees have their own and MSc have their own.</p> <p>Finnish Construction Managers and Engineers (RKL) - technicians and BSc Association of Finnish Construction Engineers (RIA) – BSc, only Finnish Association of Civil Engineers, RIL – MSc or above.</p> <p>Architects have their own association – the Association of Finnish Architects, (SAFA), and Designing Engineers have their own association – the Association of Designing Engineers (SNIL).</p> <p>Commercial interests in member activity</p> <p>Our association is not permitted to have any interest in the commercial interests of its members.</p> <p>Professional sectoral societies in particular fields/specialisations <i>(e.g. concrete, geo-technic).</i></p> <p>There are organisations for various technical/professional sectors, which have both individual members and companies as their members. There are, for example, the following associations:</p> <ul style="list-style-type: none"> - Geotechnical Association - Roof Association - Real Estate Association - Association of Road Construction - Association of Structural Steel Engineering & Construction - Association of Concrete Engineering & Construction - Association of Water and Wastewater Engineering & Construction - Association of HEVAC-Engineering & Construction - Association of Inner Climate

<p>France</p>	<p>Registration</p> <p>There is no “Chamber of Engineers” or “State Organisation” requesting Civil Engineers to register (an exception deals with Surveyors who register in an “Ordre des Géomètres”).</p> <p>CNISF manages an Engineers Directory (Répertoire Français des Ingénieurs), created in 1998, in close cooperation with Associations of Engineers. The Directory gathers altogether more than 500,000 names of Engineers working in all professional sectors.</p> <p>The Directory lists :</p> <ul style="list-style-type: none"> • “Ingénieurs Diplômés”, as defined previously, automatically registered upon request of their Alumni associations. • Holders of a French scientific Diploma (4 years studies), having worked as engineer for 5 years, registered on the basis of a file introduced by a reference Association. • Persons having gained engineering capabilities, through education (at least 2 years Studies) and/or professional practice, working at least 5 years in a position as an Engineer, recognised by firms, registered on the basis of a file. <p>Alternatively, the Civil Engineer’s profession is organised through strong Unions of Contractors, Designs Offices (etc.) : Fédération Nationale des Travaux Publics (FNTP), Fédération Française du Bâtiment (FFB), Union Syndicale des Industries Routières en France (USIRF), Syndicat des Sociétés d’Ingénierie Technique (SYNTEC), Chambre des Ingénieurs et du Conseil de France (CICF) .</p> <p>Voluntary membership of professional organisations</p> <p>There are many categories of scientific associations for engineers: either covering all sectors : “Association Française de Génie Civil (AFGC)” or dealing with specialised fields: Soil Mechanics, Earthquake Engineering, Concrete, applied Geology, etc.</p>
<p>Germany</p>	<p>Registration and right to practice</p> <p>Civil engineers can practise when they are awarded the title “Diplom-Ingenieur”. There is no registration in either national or professional organisations with the following exceptions:</p> <ol style="list-style-type: none"> a) The “Consulting Engineers” (Beratender Ingenieur) must be registered on a list of the Chamber of Engineers of a Bundesland (Landes-Ingenieur-Kammer) and most of them must be a member in the Chamber of Engineers. b) ”Prüfingenieure für Baustatik” is a special group of civil engineers. Members are appointed and licensed only by the building supervisory organisation of the federal states. They possess the respective qualifications and must have 10 years of practice in this profession. They work to the stipulations of governmental building authorities. c) Experts by building codes of the federal states. d) Surveyors

<p>./. Germany</p>	<p>Voluntary membership of professional organisations</p> <p>There are other voluntary organisations for civil engineers e.g.:</p> <ul style="list-style-type: none"> ▪ Zentralverband Deutscher Ingenieure e.V. – ZDI ▪ Verein Deutscher Ingenieure e.V. – VDI ▪ Bund Deutscher Baumeister, Architekten und Ingenieure e.V. BDB ▪ Verband Unabhängig Beratender Ingenieure und Consultants e.V. – VUBIC ▪ Verband Beratender Ingenieure e.V. – VBI <p>Commercial interests in member activity</p> <p>No, our association is not permitted to have any interest in the commercial interests of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>There are quite a lot of professional sectoral societies in particular fields/specialisations e.g. Vereinigung der Strassenbau- und Verkehrsingenieure e.V. – (BSVI) – this represents road and traffic engineers.</p>
<p>Greece</p>	<p>Registration and right to practice</p> <p>1. Chamber organisation:</p> <p>The medium for the civil engineering profession is registration after examinations with the Technical Chamber of Greece (C.T.G).</p> <p>It grants the licence to practise the profession and C.T.G. membership is obligatory. The C.T.G. has its headquarters in Athens and also has sections in all the regions of the country. It is the responsible qualifying body under public law, and the official Technical Advisor to the State. The members of its directing bodies, as well as the President, are elected by all the qualified engineers in all branches in elections held every three years.</p> <p>2. Professional organisation:</p> <p>The professional organisation of civil engineers is the Association of Civil Engineers of Greece (A.C.E.G.- Σ.Π.Μ.Ε.).The A.C.E.G. was established in 1961 as a private civil association by Court permission. The Association has 17,000 members and its headquarters are in Athens. The A.C.E.G. is the professional, syndical and scientific body of all Greek Civil Engineers with a University Degree. Membership is voluntary and open to all civil engineers with a diploma, regardless of their professional status.</p> <p>The Association has a Panhellenic character and has regional departments. The Committee of the Association is elected by its members every two years. The A.C.E.G. is not a (Trade) Union and, therefore, its members can join trade unions at their place of work, when for example they are employees. Amongst the Association’s activities is the publication of a monthly periodical and the organisation of scientific seminars.</p> <p>3. Professional federation:</p> <p>Due to the Association’s Panhellenic character and due to the fact that it groups all Greek civil engineers, regardless of their professional status, the A.C.E.G. acts as a professional federation.</p>

<p>Hungary</p>	<p>Registration and right to practice</p> <p>It is obligatory for designers and experts to be members of the Chamber of Engineers.</p> <p>Voluntary membership</p> <p>There are voluntary professional organisations for civil engineers. They represent ‘designer’ ‘super-designer’ and ‘expert’ civil engineers.</p> <p>Commercial interest in member activity</p> <p>Associations are permitted to have an interest in the commercial interests of their members, the Chamber is not permitted to do so.</p> <p>Professional sectoral societies</p> <p>There are professional sectoral societies relating to particular fields and specialisations.</p>
<p>Ireland</p>	<p>Registration</p> <p>Civil engineers are obliged to register.</p> <p>Voluntary membership of professional organisations</p> <p>Relationship to commercial interests of members</p> <p>It is not permitted for the IEI to have a commercial interest in member activity.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>Within the IEI itself there are both regional divisions within Ireland and including a London and South-East Region in the U.K. There are also sectoral divisions (including Civil) such as Biomedical Engineering; Chemical and Process Engineering; Electrical/Electronic Engineering; Energy-Environment; extractive Industries; Fire and Safety; Geotechnical; heritage; ICT; Local Government; Project Management; Roads and Transportation; Structures and Construction; Telecommunications Engineering Society; Water and Environmental Engineering Society (Please see www.iei.ie for further details).</p>
<p>Italy</p>	<p>Registration and professional organisation</p> <p>Professional organisation is represented at the provincial level by the Ordine Provinciale degli Ingegneri and at the national level by the Consiglio Nazionale degli Ingegneri.</p> <p>The Ordine Provinciale</p> <p>It is a legal entity by public law and has its seat in the relevant provincial capital. There are 103 Ordini. They all have the same structure and are self financed through the annual contributions of their members who elect the Consiglio dell’Ordine (Board) every two years. The President, Vice president and Treasurer are elected by the Consiglio among its members. The number of councillors varies from 5 to 15 according to the number of the members of the Ordine itself.</p> <p>The Consiglio dell’Ordine maintains and updates the ‘Albo’ (Article 5, law 24 June 1923, n. 1395 “Tutela del titolo e dell’esercizio professionale degli ingegneri ed architetti” - <i>Safeguard of title and of Engineers’ and Architects’ professional practice</i>). [Engineers’ and Architects’ professional regulations are covered by the same legislation, though the two professions are totally separated and each one has its own Ordine and Consiglio Nazionale]</p>

<p>./.. Italy</p>	<p>In compliance with articles 27, 37, 39 and 45 of the Royal Decree n. 2537, 1925, "Regolamento per le professioni di ingegnere ed architetto" (<i>Regulations for the Engineers' and Architects' professions</i>) the Ordini shall also carry out the following tasks:</p> <ul style="list-style-type: none"> - To carry out the management of the Ordine - To ensure that its members have to practise with integrity and care keep to the rules. <p>The Boards of the Ordini can, if necessary, take disciplinary measures ranging from an official reprimand to expulsion. Members can appeal to the Consiglio Nazionale acting as a <i>latere</i> second degree Court, against a decision of the Consiglio dell'Ordine, concerning ethics.</p> <ul style="list-style-type: none"> - To safeguard the title of Engineer; the Ordine's Boards can, if necessary, denounce the abuse to the competent Authorities. - To establish the annual contribution all members have to pay to the Ordine Provinciale. - To pay the contribution each year to the Consiglio Nazionale degli Ingegneri for its upkeep. - To advise the Public Administration, when required by the Authorities. <p>Provincial Orders can establish fees that members have to keep, relating to engineering performance not fixed at national level (see section 10).</p> <p>The D.P.R. 5 giugno (June) 2001, n. 328, modified the structure of the Albo dividing it in sections (A and B) and in sectors (civil and environmental, industrial and computer science) according to the academic formation and the State exams which the members sat.</p> <p>The different Ordini organise updating courses, and cultural technical events (over 500 events took place in 2003).</p> <p>Each Ordine issues a magazine or a regular information release to keep its members informed and to have them participate actively at the life of the structure. Many Ordini have now an internet site freely consultable.</p> <p>The Consiglio Nazionale degli Ingegneri</p> <p>The Consiglio Nazionale degli Ingegneri (CNI) is a body set up by the <i>Legge 1395/1923</i>, by the <i>Regio Decreto 2537/1925</i> and by the <i>Decreto Luogotenenziale 382/1944</i> under the Ministero della Giustizia (<i>Ministry of Justice</i>).</p> <p>The Consiglio of CNI is formed by eleven Councillors elected every three years.</p>
<p>Latvia</p>	<p>Registration</p> <p>Certificated engineers are registrated in LBS BSSI. The certificate gives engineer right to start independent practice. Certification procedure is also obligatory for foreign engineers.</p> <p>Voluntary membership of professional organisations</p> <p>There are 72 different voluntary professional organisations in Latvia acting close to civil engineering.</p> <p>Commercial interest</p> <p>Lat ACE permitted to have a commercial interest according to legislation.</p> <p>Professional sectoral societies</p> <p>There are also professional sectoral societies: Latvia Builders Association, Latvia Geotechnical Society, Latvia Road builders Association, etc.</p>

<p>Lithuania</p>	<p>Registration</p> <p>Lithuanian Association of Civil Engineers (LSIS) was established in 1991. Membership of the Association is voluntary.</p> <p>Voluntary membership of professional organisations</p> <p>There are other voluntary professional organisations. Examples: Lithuanian Association of Constructors.</p> <p>Relationship to commercial interests of members</p> <p>Lithuanian Association of Civil Engineers is permitted to have a commercial interest.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>There are also professional sectoral societies: Lithuanian Geotechnical Society, Society of Highway engineers, etc.</p>
<p>Poland</p>	<p>Registration</p> <p>Only civil engineers/architects in charge of independent technical activity are obliged to register in Polish Chamber of Civil Engineers or Polish Chamber of Architects.</p> <p>Voluntary membership of professional organisations</p> <p>Yes, these include the Polish Society of Civil Engineers, the Polish Society of Bridge Engineers, the Polish Association of Transport Engineers, the Polish Association of Water Engineers, the Polish Association of Electrical Engineers, the Polish Association of Sanitary Installations Engineers.</p> <p>Relationship to commercial interests of members</p> <p>Yes, the Polish Chamber is permitted to have an interest in the commercial interests of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>There are profession sectoral societies such as the Polish Society of Geotechnics.</p>
<p>Portugal</p>	<p>Registration</p> <p>In Portugal, Civil Engineers are obliged to register in OE (it acts also like a Chamber) if they want to work as engineers being responsible for their acts.</p> <p>Voluntary membership of professional organisations</p> <p>There are voluntary professional organisations for civil engineers. They are mainly scientific societies related to special areas of civil engineering (structural engineers, seismic engineers, geotechnical engineers, etc.), but also some of professional-type organisations, such as association of designers, association of public contractors, etc.</p> <p>Relationship to commercial interests of members</p> <p>Our association is not permitted to have any interest in the commercial interests of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>There are professional sectoral societies which operate in particular fields/specialisations, as learning societies, as referred to above.</p>

<p>Romania</p>	<p>Registration</p> <p>In Romania civil engineers do not have to register in a state organisation or in a Chamber of Engineers.</p> <p>Currently an initiative has been undertaken by the Union of the Associations of Civil Engineers for the foundation by law of a Chamber or Civil Engineers.</p> <p>Voluntary membership of professional organisations</p> <p>Voluntary professional organisations for civil engineers comprise:</p> <p>The Union of Associations of Civil Engineers in Romania was founded in 1995 with eleven associations - of Structural Engineers, Romanian Concrete Society, Romanian Geotechnical Society, Romanian Association of Earthquake Engineering, Romanian Tunnelling on, etc.</p> <p>The Union represents the member associations and societies in relations with governmental or non-governmental bodies of Romania as well as in relations with similar national and international organisations.</p> <p>Membership of the Union and of any of its member associations and societies is voluntary.</p> <p>Relationship to commercial interests of members</p> <p>UAICR is not permitted to have any interest in the commercial interest of its members.</p> <p>However, associations which are UAICR members publish journals (i.e. Romanian Geotechnical Journal, Romanian Journal of Materials, Bulletin of the Association of Structural Engineers, Romanian Journal of Tunneling etc.) to be sold without profit. Also, UAICR and its members organise national and international conferences at which costs are covered by registration fees and sponsorship.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>The following professional sectoral societies exist in particular fields/specialisations in Romania:</p> <p>The Union of Associations of Civil Engineers in Romania comprises sectoral societies: e.g. Structural Engineers, Romanian Concrete Society, Romanian Geotechnical Society, Romanian Association of Earthquake Engineering, Romanian Tunnelling on, etc.</p> <p>The Union represents the member associations and societies in relations with governmental or non-governmental bodies of Romania as well as in relations with similar national and international organisations.</p> <p>Membership of the Union and of any of its member associations and societies is voluntary.</p>
<p>Russia</p>	<p>Registration</p> <p>In Russia civil engineers do not have to register in a state organisation.</p> <p>Voluntary membership of professional organisations</p> <p>Membership in professional associations or societies is voluntary. These societies represent different fields of the civil engineering profession such as structural engineering, road/motorway/railway engineering, dam engineering, water engineering, project management, geotechnical engineering, etc. Usually, members constitute a mix of designers, contractors, consultants, and civil servants.</p> <p>Relationship to commercial interests of members</p> <p>The Russian Society of Civil Engineers is a not-for-profit voluntary association.</p>

<p>Slovak Republic</p>	<p>Registration</p> <p>An authorised engineer is obliged to register with the Slovak Chamber of Civil Engineers. Civil engineers are not obliged to register. They may be registered with the Slovak Chamber of Civil Engineers, the Slovak Association of Civil Engineers or other organisations.</p> <p>Voluntary membership of professional organisations</p> <p>There are voluntary professional organisations for civil engineers in Slovakia:</p> <ul style="list-style-type: none"> - The Slovak Association of Civil Engineers (Slovenský zväz stavebných inžinierov) - ABF Slovakia – The Slovak Association for Development of Slovak Architecture and Construction (Združenie pre rozvoj slovenskej architektúry a stavebníctva) - The Slovak Chamber of Architects (Slovenská komora architektov) - The Association of Construction Entrepreneurs of Slovakia (Zväz stavebných podnikateľov Slovenska). <p>Relationship to commercial interests of members</p> <p>The Slovak Chamber of Civil Engineers is a non-profit organisation; therefore, it is not permitted to have any interest in the commercial interest of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <ul style="list-style-type: none"> - The Association of Price Estimators (Asociácia stavebných cenárov) - The Slovak Concrete Society (Slovenský betonársky spolok) - The Chamber of Surveyors and Cartographers (Komora geodetov a kartografov) - The Slovak Association of Engineering Geologists (Slovenská asociácia inžinierskych geológov) - The Society of Structural Engineers concerned with Statistics of Slovakia (Spolok statikov Slovenska) - The Society of Eletrotechnical Engineers (Spolok elektrotechnickýinžinierov), etc.
<p>Slovenia</p>	<p>Registration</p> <p>Only engineers wishing to obtain licence for the responsible stage in design, control and construction activities are registered.</p> <p>Voluntary membership of professional organisations</p> <p>A number of voluntary professional organisations (societies, according to the Societies Act) exist in the field of CE which represents different fields of the profession such as structural engineering, road engineering, water engineering, dam engineering, geo-mechanical engineering, etc.</p> <p>Commercial interest</p> <p>No, IZS – MSG does not interfere in the commercial interests of its members.</p> <p>Professional sectoral societies in particuar fields/specialisations</p> <p>Please refer to answer 7.2 above.</p>

<p>Spain</p>	<p>Registration</p> <p>It is mandatory to be a member of the Colegio de Ingenieros de Caminos, Canales y Puertos in order to practise as a civil engineer in Spain.</p> <p>Voluntary membership of professional organisations</p> <p>Asociación de Ingenieros de Caminos, Canales y Puertos which is a private and voluntary association of Spanish civil engineers.</p> <p>Commercial interest</p> <p>This issue is not ruled by law, however, it is not at all in the spirit of the Colegio to have any commercial interest of any kind of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>In this point it should be highlighted that in Spain in there is an especially large number of professional/technical associations which comprise all areas related to civil engineering: highways, large dams, energy, construction material, concrete, bridges, tunnels, etc.</p>
<p>Turkey</p>	<p>Registration</p> <p>Membership of the Chamber of Civil Engineers is not obligatory for engineers working in the public sector. It is up to the engineers' free will to become a member while working in public sector. The private sector requests the Chamber for membership. Inspection rights of the Chamber can only be subjected to the private sector engineers.</p> <p>Voluntary Membership of Professional Organisations:</p> <p>There are various organisations operating on a voluntary membership basis for civil engineers, with various goals and themes. In addition to organisations related to the civil engineering branch, there are national civil engineering societies, such as the Turkish Contractors Association, the Union of International Contractors-Turkey, the Association of Turkish Consulting Engineers and Architects, the Foundation of Civil Engineers, The Turkish Employers' Association of Construction Industries, etc. These organisations represent civil engineers from all areas and sectors, which cover all divisional applications.</p> <p>Relationship to commercial interests of members</p> <p>Considering the interest of TCCE in the commercial interest of members as the income of chamber, our organisation has a three way income. These are as follows:</p> <ul style="list-style-type: none"> - As an inspection on professional applications, projects are recorded and confirmed as seen by the Chamber before they are presented to local authorities for licence. The Chamber requests a fee from the project-owner calculated on the basis of project cost with specified constraints and percentages. - There are specific documents and certificates that members are to be given in case of member-chamber relations or professional procedure of the members. Identifications, registration information certificates, membership certificates, etc. There are specific fees for provision of these documents. - Promoting and providing experts for profession are included in chamber applications. This can be realised in two ways: income from applications for being legal court experts for the Ministry of Justice, and a share from other referee expertise situations which are not court-related.

<p>./. Turkey</p>	<p>Professional sectoral societies in particular fields/specialisations</p> <p>There are organisations focused on particular fields or applications, such as the Turkish Precast Concrete Association, the Turkish Ready Mixed Concrete Association, the Association of Building Control Organisations, the Association of Heat Sound and Water Isolation, etc.</p>
<p>United Kingdom</p>	<p>Registration</p> <p>There is no obligatory registration.</p> <p>Voluntary membership of professional organisations</p> <p>Yes. The Institution of Civil Engineers is the main qualifying body and learned society for civil engineers. It represents all civil engineers regardless of their specific field of work. Structural engineers also have their own institution, the Institution of Structural Engineers.</p> <p>Relationship to commercial interests of members</p> <p>No, ICE is a registered charity whose role is to be a qualifying body and a learned society. It is not permitted to have any interest in the commercial interests of its members.</p> <p>Professional sectoral societies in particular fields/specialisations</p> <p>Yes, there are various societies associated with ICE which cater for specific areas of civil engineering, e.g. the British Dam Society, the British Geotechnical Association, the British Tunnelling Society etc.</p>

CHAPTER 8

LEGAL BACKGROUND TO THE PROFESSION

This chapter aims to illustrate the legal framework in which civil engineers operate in their respective countries.

Three questions were asked of member organisations.

- 8.1 - Are there legal restrictions to the functions?
 8.2 - How are building and construction laws regulated?
 8.3 - Is there personal liability for damage, defects etc.?

COUNTRY	
Croatia	<p>Regulation of activity</p> <p>Company responsibility is regulated by the Building Law and the Civil Law. The contractor is responsible for all damage made to the client, public property and individuals during construction work and within the subsequent guarantee period. If human lives are endangered or if great material damage occurs, criminal prosecution may also take place in accordance with the Penal Code. In this case, contractor's employees responsible for damage, structural collapse or loss of human life or injuries may be prosecuted.</p> <p>Personal liability</p> <p>Personal responsibility for services offered lies with designers, supervision engineers and project control engineers who are members of the Chamber. They have an individual insurance policy which covers individual responsibility for errors committed during professional work. The annual fee is dependant on the size and complexity of work in which they are involved.</p>
Cyprus	<p>Legal restrictions to the functions and regulation of activity</p> <p>There are legal restrictions to the functions in Cyprus. The building and construction laws are enforced by the local authorities (municipalities or district offices) and the Department of Town Planning of the Ministry of Interior.</p> <p>Personal liability</p> <p>The design engineers have personal liability for damages, defects etc.</p>
Czech Republic	<p>Legal restrictions to the functions</p> <p>Civil engineers are generally governed by the same law as those for other people. Construction activity is also governed by building law. Selected activities may be performed only by the persons who have a proven professional qualification.</p> <p>Regulation of activity</p> <p>Building and construction laws are regulated by law.</p> <p>Personal liability</p> <p>Liability for defects in construction or damage caused thereby is governed by common law.</p>

<p>Estonia</p>	<p>Legal restrictions to the functions</p> <p>All companies should have a licence in order to carry out design and construction work.</p> <p>Regulation of activity</p> <p>In Estonia there are two laws for regulating the building and construction process: The Planning Law and The Construction Law.</p> <p>All companies should have a licence in order to carry out design and construction work.</p> <p>Personal liability</p> <p>Responsibility for damage and defects is regulated by contract agreement and by insurance agreement.</p>
<p>Finland</p>	<p>Legal restrictions to the functions</p> <p>Certain functions e.g. designing and engineering of load bearing structures have minimum educational requirements and minimum working experience requirements.</p> <p>Regulation of activity</p> <p>The Ministry of Environment regulates all building and construction laws, except electrical works, which are regulated by the Ministry of Industry.</p> <p>Personal liability for damage, defects, etc.</p> <p>Liability in the event of damage or defect or equal is usually not personal. The company where the person is working normally accepts this kind of liability (i.e. professional liabilities) according to insurance agreements. In cases of accidents or damages due to e.g. personal negligence, according to the law the liability can also be personal.</p>
<p>France</p>	<p>Legal background to the profession</p> <p>The general rules in France are the “Code Civil” and “Code Pénal” which apply to everyone including Engineers.</p> <p>Regulation of activity</p> <p>There are many rules and regulations governing construction. If infringed, these may contain sanctions which may require proofs in the Courts. Professional engineers and construction firms must know these Rules and Regulations though they never supplant Civil Law for construction work.</p> <p>Personal liability for damage, defects etc.</p> <p>Generally, damages are decided under the “Code Civil”. However, in special instances (public and workers’ safety, fire protection, special dangers and risks, etc.), the rules and regulations contain sanctions other than damages.</p> <p>The contractor is liable to the owner for the quality of the construction and any defects that may become apparent over the first 10 years. He, in turn, can claim that the fault lies with the architect or the consulting engineer. The Court will then decide.</p> <p>Employers are always responsible for all consequences of their work and can not lodge any claim against any employee. The employer shall be insured during construction for any damage caused by the client, third parties or his own employee. This applies to engineering and consulting firms provided they have not entered into a contract appointing him or them personally.</p>

<p>./.. France</p>	<p>In this event, claims and charges of offence can be lodged against him or them as individuals. As such, engineers are responsible in cases of infringement of construction codes and if at fault. They are then liable to the other party to the contract. They shall be insured for any liability other than those accepted contractually by the other party. However, there is no obligation to engage a civil engineer.</p>
<p>Germany</p>	<p>Legal restrictions to the functions</p> <p>Yes, there are legal restrictions, for example the State Building Law and that of the Federal States.</p> <p>Regulation of activity</p> <p>Building and construction laws are regulated by the supervision of building by the state, federal state and the local authority area.</p> <p>Personal liability</p> <p>Yes, there is personal liability for damage, defects etc – it is regulated by common law.</p>
<p>Greece</p>	<p>The civil engineering profession, as dealing with public interest and safety matters, is fully regulated and protected. Both in private and public design and construction, the civil engineer is subject to very strict legal and administrative regulations, his responsibility is practically unlimited, and besides he is subject to the rules of professional conduct set by the Technical Chamber of Greece (C.T.G.) and the Association of Civil Engineers.</p> <p>1. Protection of title</p> <ul style="list-style-type: none"> - Protection of title exists since 1930 (law 4663/1930) and provisions of the civil code for the profession. - determined by the law 4663/1930, Article 11, par a and b; - Registration to the C.T.G. follows success in examinations for practice licence, immediately after engineers have obtained their academic diplomas. <p>2. Responsibility of function</p> <p>The most recent regulations date from 1974 (law 696/1974): relating to the technical requirements and the fee scale for the design of most engineering and building projects.</p> <ul style="list-style-type: none"> - Registration to C.T.G. and to the regional Management Office (Bureau d'Aménagement regional) vis-à-vis the State, the provisions of the law 696/1974; - the engineer is controlled by Public Authorities (Urban Management Offices, Ministries, Prefectures and according to circumstances, the C.T.G.); Throughout the undertaking of the project and the execution; - conforming, in each case, to the relevant legislation (Public Works Conditions, E.O.T. (National Tourism Organisation), Archeological Service etc. by the Police and also ex-officio. The Presidential Decree 723/1979 on Continuing Arbitration for Differing Techniques also applies. - Article 286 of the Penal Code mainly establishes his responsibility. <p>3. Building by laws/responsibilities</p> <p>Building activity is regulated:</p> <ul style="list-style-type: none"> - by the G.O.K. (General Building Regulations) of the State (1985) and its late amendments (2000)

<p>./. Greece</p>	<ul style="list-style-type: none"> - by the Town-Planning Act; - by the Penal Code. - by the code which refers to the Design and Execution of Reinforced Structures and which is a Presidential Decree. - by the Anti-Seismic Code which stands as a Presidential Decree. - by the Public Works Execution law 1418/1984 relating to the Contractor's responsibilities. - by the law which refers to the responsibilities of the persons involved in the construction works, i. e. the owner, contractor, sub-contractor and engineer. - by the law relating to the security precautions to be taken during the execution of engineering works. <p>There is provision for sanctions:</p> <ul style="list-style-type: none"> - in the case of accident, or of giving wrong details of the project in progress, or violation of the building permission, or faulty execution, or violation of the articles of the G.O.K.; - in the case of breach of safety precautions during the execution, of legal violating, or breach of the Town Planning legislation or of the G.O.K. <p>The sanctions are imposed statutorily and ordinarily by the C.T.G. (Disciplinary Council) and the discipline administered by the Tribunal.</p> <p>4. Obligation to engage a civil engineer</p> <p>In building projects it is obligatory to engage an architect or civil engineer. Topographers and graduates of non-university-level technical schools can be involved in building projects up to two storeys high.</p> <p>In the case of special structure buildings, that is large spans, specific foundations, shell structures, space frame analysis construction etc., it is obligatory that a civil engineer signs the structure project.</p> <p>In projects, other than buildings, which are usually referred to as civil engineering projects it is compulsory to engage a civil engineer. Topographers can be involved in road and hydraulic projects.</p> <p>5. Code of professional conduct</p> <p>The code of the profession in cases of breach of discipline is under the authority of the disciplinary council of the C.T.G. (Moral sanctions are also imposed by the administrative council of the A.C.E.G). In the C.T.G. there is a Code of professional conduct for all qualified engineers. The disciplinary sanctions imposed, after complaint from another engineer or a citizen; vary from reprimand to a suspension of licence to practice the profession for a period of time.</p>
<p>Hungary</p>	<p>Legal restrictions to the function</p> <p>There are legal restrictions to the function.</p> <p>Regulation of activity</p> <p>Building and construction laws are regulated by the law on building and the defence of the environment.</p> <p>Liability</p> <p>There is personal liability for damage and defects.</p>

<p>Ireland</p>	<p>Legal restrictions to the functions There are legal restrictions.</p> <p>Regulation of activity Regulation is by Statutory Bodies and Local Authorities.</p> <p>Liability This depends on case and circumstance.</p>
<p>Italy</p>	<p>Legal restrictions to the functions Some engineering activities are reserved by law (Article 2229 of the Civil Code) to safeguard, in particular, the safety and the health of citizens. To pursue them, engineers shall have successfully passed the State Exam and be enrolled in the 'Albo'.</p> <p>As there are many provisions relevant to the reserved activities, it is not possible to list them in this publication. They may be consulted in the web site of the Consiglio Nazionale degli Ingegneri (CNI) www.tuttoingegnere.it</p> <p>Regulation of activity Private contracts are ruled by the Codice Civile (Civil Code) - Article 1655 and the following ones. Public contracts are ruled by law 11 February 1994, n. 109, as modified by law 2 June 1995, n. 216, concerning the implementation of public works.</p> <p>D.P.R. 328/2001 (Decreto del Presidente della Repubblica 5 giugno 2001 – Decree of the President of the (Italian) Republic of 5th June 2001), introduced modifications to requirements for admission to State examinations relating to the exercise of certain professions. Beyond specifying sectoral activities, this decree provides for the competences required to pursue specific activities.</p> <p>Liability Civil and environmental engineers are, presently, not obliged to take out an insurance policy covering the risks resulting from their professional activity.</p> <p>Engineers pursuing their designing activity as an employee of the public administration as well as free professionals shall take out an insurance policy only in relation to public works, governed by Law 109/1994.</p>
<p>Latvia</p>	<p>Legal restrictions All the companies taking part in tendering (Law on State and municipality procurement) of design and construction works shall have a licence. To obtain a licence, a company, depending on its profile, specifications and scope of work, should employ at least one engineer who is certified in a defined field of activity.</p> <p>Regulation of activity There are different laws (for example: Building Law, Law on Roads, Law on Railways, Law on road traffic, Law on State and Municipality Procurement, Civil Law ect); different regulations of the Cabinet of Ministers; designing, construction, materials, testing etc. standards; national and international contract conditions and agreement; quality assessment system, etc., regulating all the building process.</p> <p>Personal liability Personal liability for damage and defects is regulated by contract agreement and by insurance agreement. In serious cases (expertise decision) engineer's Certificate can be revoked.</p>

<p>Lithuania</p>	<p>Legal background to the profession Building activities are regulated by the Building Law.</p> <p>Regulation of activity All companies should have a licence for design and construction works.</p> <p>Liability Responsibility for damage and defects is regulated by contract agreement and by insurance agreement.</p>
<p>Poland</p>	<p>Legal restrictions to the functions Individual building authorisation for civil engineers, obligatory membership in Polish Chamber of Civil Engineers for engineers in charge of independent technical activity.</p> <p>Regulation of building and construction activity This is carried out by means of the Polish Building Law and state authority represented by Main Office for Building Superintendence on local (district, region) and state level.</p> <p>There is personal liability for damage, defects, etc.</p>
<p>Portugal</p>	<p>Legal restrictions to the functions Yes, there are legal restrictions to the functions.</p> <p>Regulation of building and construction activity Building and construction activities are regulated by law.</p> <p>Personal liability for damage, defects etc. There is personal liability for damage, defects, etc. in relation to design and construction. Engineers should have a professional insurance.</p>
<p>Romania</p>	<p>Legal restrictions to the functions The only recognised qualifying bodies for the profession are the Universities. There is no legal code governing the protection of the profession. There are no legal restrictions on what functions may be performed by civil engineers.</p> <p>Regulation of the sector Construction activity is regulated by the Law of Quality in Constructions (Law No. 10 of 18 January 1995) and by a large number of technical Rules and Regulations.</p> <p>Liability There is a personal liability for damages.</p>
<p>Russia</p>	<p>Legal restrictions to the functions All companies should have a licence in order to carry out design and construction work.</p> <p>Regulation of activity There are laws for regulating the building and construction process which are controlled by municipal and state authorities.</p> <p>Personal liability Responsibility for damage and defects is regulated by contract agreement and by insurance agreement.</p>

<p>Slovak Republic</p>	<p>Legal Restrictions to the Functions</p> <p>The Slovak legislation determines the general rules for civil engineers (as natural and legal persons). Civil engineers are generally governed by the Civil Code, the Trade Code and Act No. 455/2001 Coll. on Small Businesses (Small Business Act) as amended by subsequent regulations.</p> <p>Regulation of Activity</p> <p>Activities in this field are regulated by law, e.g.:</p> <ul style="list-style-type: none"> - Building Act No. 50/1996 Coll. as amended by subsequent regulations (in this act the Council Directive No. 89/106/EEC on Construction Products is implemented), - Act No. 138/1992 Coll. on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations, - Act No. 608/2003 Coll. on State Administration for Territorial Planning, the Construction Code and Housing, - Act No. 330/1996 Coll. on Safety and Health Protection at Work, - Act No. 95/2000 Coll. on Labour Inspection as amended by subsequent regulations, etc. <p>Furthermore, the members of the Slovak Chamber of Civil Engineers must comply with the Statute of the Slovak Chamber of Civil Engineers.</p> <p>Personal Liability</p> <p>According to the Act No. 138/1992 Coll. on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations, authorised engineers are obliged to take out liability insurance regarding the damage that may arise in connection with their activities and the activities of their employees. They are obliged to insure themselves within 10 days following their registration in the Register of Authorised Civil Engineers and notify the Slovak Chamber of Civil Engineers of doing so.</p> <p>Furthermore, liability arises also from the Labour Code.</p>
<p>Slovenia</p>	<p>Legal restrictions to the function</p> <p>Company and personal responsibility is regulated by the Construction Act and Obligatory Act. The contractor is responsible for all damage to the client, public property and individuals during construction work and within the subsequent guarantee period (up to 10 years). If human lives are endangered or if major material damage occurs, criminal prosecution may take place.</p> <p>Building and construction regulations</p> <p>The ZGO (<i>Zakon o graditvi objektov</i> - Law on Building Construction) is the basic law which regulates the responsibilities and prosecutions for false professional actions in the design and construction phase of the project.</p> <p>Personal liability</p> <p>Personal liability is clearly defined by the same act.</p>
<p>Spain</p>	<p>Legal restrictions</p> <p>In order to practise as a civil engineer it is necessary to prove that you are the owner of the corresponding official degree and a member of the Colegio de Ingenieros de Caminos, Canales y Puertos.</p> <p>Regulation of activity</p> <p>In Spain these activities are ruled by law. At national level the two most important are the 'Ley de Contratos con las Administraciones Publicas' (law</p>

<p>./. Spain</p>	<p>on contracting with public administration) which regulates the contracts with the public administration and the 'Ley de Ordenación de Edificación' (building law) which regulates the requirements of the buildings. Furthermore, each autonomous region has numerous rules and regulations which regulates the construction activity.</p> <p>Personal liability Liability for defects in construction or damage caused thereby is regulated by common law.</p>
<p>Turkey</p>	<p>The legislation system on Civil Engineering profession in Turkey has flawed applications and regulations. There are various legal arrangements for civil engineering functions, but most of the control issues are omitted from these legislations.</p> <p>Building and construction regulations are handled by Ministry of Prosperity. Although TCCE is a body which has an effect on legal regulations, the general unstable political situation of Turkey leads to unstable applications of legislation. Recent advances in construction regulations are not enough certainly, but feature a step forward in the government's long-term inert knowledge.</p> <p>Liability is thus an unsolved problem for the Turkish Civil Engineering sector. Personal liabilities are bounded but not well defined officially. The results of this problem are seen clearly after earthquakes, and encountered often as Turkey is a seismic region.</p> <p>New legislative arrangements and studies of regulations, which are held related to the EU legal framework, will possibly occur soon. Within the meetings held by our Chamber and the Ministry, legal penalties are handled related to service areas and duration of liability issues. The results of these meetings indicate that the duration of personal liability would probably be 15 years. These studies and improvements enable personal liability regulations in Turkey to be based on an understanding of the issue and thus more specific and valid for progress in the short-term.</p> <p>Insurance is an important part of the legal aspects of civil engineering, and studies are ongoing. Earthquake-related problems have clearly illustrated the lack of specific insurance stability. This issue is handled in Chapter 11.</p>
<p>United Kingdom</p>	<p>There are no legal restrictions as such to the functions that can be carried out by engineers. However, many aspects of English and Scottish law have an impact on professional practice.</p> <p>Regulations With regard to building activities, there are separate Building Regulations for Scotland and England/Wales, which state that certain design calculations have to be certified by a person who is "authorised by the appropriate designated authority in accordance with the European Communities (Recognition of Professional Qualifications) Regulations 1991 to practice the profession of chartered civil engineer or chartered structural engineer in the United Kingdom". This normally applies to larger public projects.</p> <p>Liability According to the current legislation on Health and Safety at Work, liability is absolute and rests with whoever is responsible for the breach.</p>

CHAPTER 9

CONTRACTS

This chapter covers the type of contract available to the client in a construction project. It also questions the type of tenders put forward for projects in member countries. Further mention of tenders also appears in Chapter 10 where members were asked about the use of fee scales in their respective countries.

- 9.1 - *Is a client free to adopt any type of contract (s)he wishes?*
- 9.2 - *What particular types of contract are used?*
- 9.3 - *What is the most common system for tendering for public projects in your country?*
- 9.4 - *Is the normal criteria, lowest tender?*
- 9.5 - *What other criteria may be taken into account?*
- 9.6 - *Is electronic tendering used frequently in your country? Is it, or will it soon be obligatory?*

COUNTRY	
Croatia	<p>Type of contract</p> <p>The client is free to accept any type of contract. Contract fees for design and supervision services are defined in detail in the Chamber's List of Fees. The best offer is not necessarily the lowest one. The Client can make his selection based on the designer's references.</p> <p>Common system and criteria for tendering for public projects</p> <p>According to the law currently in force, in public tendering, the lowest offer is deemed to be the best. This provision is now being reconsidered and will probably be modified. Tendering and contracting for public construction works is regulated by the Public Procurement Law which is in fact based on relevant European Directives.</p> <p>Different types of contracts are used in practice: turn-key contracts, fixed price contracts, unit price contracts, etc.</p> <p>Use of electronic tendering</p> <p>Electronic tendering has not as yet been introduced.</p>
Cyprus	<p>Type of contract</p> <p>A client is free to adopt any type of contract (s)he wishes.</p> <p>A series of contracts have been published by the Cyprus Joint Committee for Building Contracts on the basis of which is the JCT contracts. Members of the Cyprus Joint Committee for Building Contracts are the following organisations:</p> <ul style="list-style-type: none"> (a) Cyprus Association of Civil Engineers (b) Civil Engineers and Architects Association (c) Cyprus Association of Architects (d) Cyprus Association of Quantity Surveyors (e) Cyprus Federation of Building Contractors.

<p>./.. Cyprus</p>	<p>These contracts are generally used by the private sector of the building industry. The FIDIC conditions of contract are generally used in public projects. The system used for tendering of public projects is that which is specified by the relevant Public Procurement Directive of the European Union.</p> <p>Common system and criteria for tendering for public projects</p> <p>Normal criteria for award is the lowest tender within specification. For large specialised public projects, the pre-qualification system is used.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is sometimes used by some public organisations.</p>
<p>Czech Republic</p>	<p>Type of contract</p> <p>A Private client is free to adopt whatever kind of contract (s)he wishes. For the Public client – tendering is according to Czech tendering law</p> <p>Common system and criteria for tendering for public projects</p> <p>The normal criteria is indeed usually the lowest tender. Other criteria that may be taken into account are the period of realisation, technical, economic and financial reliability of a company.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is not used frequently.</p>
<p>Estonia</p>	<p>Type of contract</p> <p>A private client is free to adopt any type of contract. Public clients are obliged to call for an open tender. For international contracts the FIDIC system is recommended.</p> <p>Common system and criteria for tendering for public projects</p> <p>The most common system is that of lowest tender, but the importance of other factors (quality, terms, etc.) is increasing.</p> <p>Use of electronic tendering</p> <p>The use of electronic tendering is not obligatory in Estonia.</p>
<p>Finland</p>	<p>Type of contract</p> <p>Public procurement processes in Finland are conducted according to EU-regulations and Finnish laws and regulations. Private procurement is done as the client wishes, but follows common practice and guidelines.</p> <p>Common system and criteria for tendering for public projects</p> <p>The tendering regulations states that the “most economic” tender shall be selected. Usually that means that the lowest bid will be chosen. However, the maintenance cost should also be considered (which of course is difficult), but gives the possibility to also consider quality and other criteria when making the decision.</p> <p>Use of electronic tendering</p> <p>All tender documents are in PC-applicable form and normally distributed by e-mail. Tenders can be submitted in electronic form (e.g. CD-Rom) or by e-mail, but signed documents are generally required to verify the tender or contract.</p>

France	<p>Type of contract</p> <p>The type of contract to be adopted is free for private business.</p> <p>For public services, terms of references and fees of design and engineering are defined by law under the “Maîtrise d’Œuvre Publique” (MOP) Act.</p> <p>Common system and criteria for tendering for public projects</p> <p>Calls for tender and public procurement are ruled by the “Code des Marchés Publics”. The possibility of selecting the best offer rather than the cheapest one is taken under consideration.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is not yet really developed.</p>
Germany	<p>Type of contract</p> <p>In Germany a private client is free to adopt any type of contract he wishes, whereas public clients are obliged to call for tenders.</p> <p>With regard to types of contract, normally the German regulations of ‘VOB’ are used.</p> <p>Common system and criteria for tendering for public projects</p> <p>The most common system of tendering is public tendering.</p> <p>Price is normally one of the main factors in tendering.</p> <p>Other criteria that may also be taken into account are economic viability, availability of equipment, success in other projects, long-lasting co-operation, etc.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is used more and more, data banks are offered. It is especially necessary for so called ARGEs (a group of co-operating companies on a temporary basis and on a special project). In some Bundesländer (Federal regions) a special software is used which must also be used by the tendering companies. Electronic tendering is not obligatory.</p>
Greece	<p>1. Private commissions</p> <p>Civil engineers can act as consultants (design and monitoring) or as contractors. In small private works both functions can be attributed to the same person.</p> <ul style="list-style-type: none"> - Parties of the contract: employer (private) and engineer; - contract responsibility; project-study and control of the execution of the works; - type of contract; a special form (provided by the Office of Urban Management and published by the Prefecture) in which the owner states that he appoints a certain engineer to undertake the design and/or supervision of the building project. In return the engineer states that he accepts to undertake the project. There is no official form of contract and it is therefore a matter of agreement between the parties involved. Any form of contract though should usually refer to the fee scale code. - validity: initially 12 months with the right to prolong to 2 years; - rights and obligations of the parties; relative to the activities in the project and its execution. The obligation of the civil engineer is the full design of the project and its supervision, that of the client is the payment of at least the minimum legal fees. These fees are determined according to the Scale of

<p>.I. Greece</p>	<p>Fees of Engineers, and the civil engineer receives his fees through the C.T.G. The bond (in duplicate) for payment of the fees is a presupposition for the issue of a permit for all construction.</p> <p>In case of construction contract there is no special form except the provisions of Civic Code. There is a set of legislation rules for private works under discussion but this is not yet in force at the time of writing.</p> <p>2. Public works contracts</p> <p>There are two types of Public Works Contracts, a) for the provision of services (design, monitoring and management of a Public Works Project) and b) for the Execution (Construction) of a Public Works Project.</p> <p>The commissioning of the design of a public project is done according to Law 3316/2005 which conforms with Directive 18/2005. These commissions are entrusted solely to engineers registered in the G.E.M. (General Register of Engineers eligible for Public Works). The registration assumes that the engineer is not a public-works contractor. The licence (given by the G.E.M.) covers a number of fields in engineering (urbanism, architectural design, restoration planning, structural road, hydraulic etc.) Each engineer chooses two fields at most. The licences (personal) of eligible engineers are divided into three classifications:</p> <ul style="list-style-type: none"> a) Class A for each engineer with 4 years of experience; b) Class B for engineers with at least 8 years of experience. This experience must be proved by presenting work and factual evidence to justify it (certification by private or public clients); evidence of post-university studies would have quite an important role; c) Class C for engineers with at least 12 years of experience and based on presentation of the whole of their work. <p>A Special Council, which has its base in the Ministry of Public Works, where the C.T.G. is also represented, judges whether the proof of experience is sufficient to justify the licence for each classification. In commissioning projects the public sector (the State) advertises, then the interested engineers respond, and finally the public sector makes the selection.</p> <p>A group of engineers (2 or 3) can form an association which acquires a licence of higher level (Class D or E) than that which could be acquired by each engineer on his own. There is a scale published by the Ministry of Public Works which determines the maximum estimated cost of a project for which each class can tender for. Usually engineers from different fields officially collaborate to undertake the design of a building project, that is an architect, a civil engineer and a mechanical and electrical engineer.</p> <p>Recently it is common that both the design and construction of a project are tendered for together. In this case the consulting engineers have to deal with the construction firms and not with the Public Authorities. The other way of giving commission for public projects is by advertisement for a public competition. In both cases the contracts are made between the public sector (State) and the engineer. The amount of fees is determined according to the Scale of Fees and the "brief" or Specification for the project.</p> <p>The execution of Public Works has to comply with the Law 1418/1984 and its amendments L.2940/2001, and 3263/2004, with the relative presidential Decrees and with a great number of Ministerial Decisions and Technical Specifications. Engineers interested in undertaking the construction of public works must enrol, as an individual person, in the Register of the constructors Experience (M.E.K.) that is held by the Ministry of public works.</p> <p>Engineers, and mostly civil engineers, who are members of the M.E.K. can form construction firms either individually or by grouping with other M.E.K.</p>
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<p>.I. Greece</p>	<p>members and enrol in the Register of the Construction Firms Experience (M.E.EΠ.) . Depending on the experience, machinery and financial level, the firms are classified under certain categories and classes. There are seven works categories, such as building, port construction, hydraulic, road construction etc. and seven classes of registration which are based on the maximum estimated cost of projects which each firm can undertake. Up to class “3” the firms are formed by engineers who are members of the M.E.K. From class “4” onwards, construction firms must have the form of a legal society. In this case the firms’ partners do not have to be engineers, even though it is obligatory that the firms consist of a minimum number of engineers.</p> <p>The usual manner of tendering for Public Works Projects is through an open process of inviting the constructors for tendering on the basis of the design and the estimated cost of the project. Some Public Authorities ask for tenders from a restricted list of constructors.</p> <p>By the recent Law 3263/2004, the only criterion for commissioning is based on the lowest tender, if all the other requirements are fulfilled.</p> <p>The Directive 305/1972 and the recent 18/2004 have been mostly incorporated in the Public Works Legislation.</p> <p>There is a standard Contract for the Construction of Public Works as well as a Standard General Obligations document.</p> <p>The usual guarantee period for a project is two years from the date of acceptance of the construction from the Public Authority.</p>
<p>Hungary</p>	<p>Type of contract</p> <p>A client may adopt a particular type of contract according to the licence (s)he is given by the Chamber.</p> <p>Tendering for public projects is harmonised in line with the European Directives.</p> <p>Common system and criteria for tendering for public projects</p> <p>Regrettably, the normal criteria is often the lowest tender.</p> <p>Other criteria may be taken into account. These are the normal criteria which one finds used internationally.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is not frequently used in Hungary.</p>
<p>Ireland</p>	<p>Type of contract</p> <p>The client is free to adopt whichever type of contract (s)he wishes. The types of contract used as IE, FIDIC and ICE.</p> <p>Common system and criteria for tendering for public projects</p> <p>It would appear that lowest tender is the most likely criteria. Other criteria which may be taken into account are quality, delivery etc.</p> <p>Use of electronic tendering</p> <p>Electronic tendering is not used frequently in Ireland and it is unlikely that it will become obligatory in the near future.</p>
<p>Italy</p>	<p>Type of contract</p> <p>Professional commitments by the public Administration are ruled by law 109/1994 and later updates as well as by the Law Decree 157/1955 implementing the Directive 92/50/EEC on supply of services.</p>

<p>.I. Italy</p>	<p>Commitments to private clients are free, but the minimum fees are fixed by law and are binding (D.M. 4 April 2001). They are drawn up with a conventional model contract in compliance with the performance specifications.</p> <p>Common system and criteria for tendering for public projects</p> <p>Professional commitments by public Administration are ruled by law 109/1994 and later updates as well as by the Decree Law 157/1955 implementing the Directive 92/50/EEC on the supply of services.</p> <p>Commitments to private clients are free, but the minimum fees are fixed by law and are binding (D.M. 4 April 2001). They are drawn up with a conventional model contract in compliance with the performance specifications.</p> <p>Use of electronic tendering</p> <p>E-tendering is still not allowed in Italy</p>
<p>Latvia</p>	<p>Type of contract</p> <p>The client is not always free to adopt any type (s)he wishes. The type of contract depends on the client (government, municipality, private etc.), price and type of procurement. The tendering procedure and type of contract are regulated by the “Law on State and Municipality procurement” and corresponding regulations of the Cabinet of Ministers.</p> <p>In practice we use lowest price.</p> <p>Common system and criteria for tendering for public projects.</p> <p>In Latvia when there are big public construction objects tendering should be announced internationally. In these cases we use international contract conditions (FIDIC).</p> <p>Use of electronic tendering</p> <p>Use of electronic tendering is not yet obligatory in Latvia.</p>
<p>Lithuania</p>	<p>Type of contract</p> <p>A private client is free to adopt any type of contract. For international contracts the FIDIC system is recommended.</p> <p>Common system and criteria for tendering for public projects</p> <p>Public clients are obliged to call for an open tender. It is essential to sign a contract with lowest price, however, other factors are also important : quality, terms, etc.</p> <p>Use of electronic tendering</p>
<p>Poland</p>	<p>Type of contract</p> <p>The private client is free to adopt any type of contract (s)he wishes. For the public client this is according to Polish Tendering Law. The type of contract used is the so called ‘civil contract’ according to Polish Codex of Civil Law</p> <p>Common system and criteria for tendering for public projects</p> <p>This is the so called ‘non-limited auction’. The normal criteria is lowest tender. Other criteria that may be taken into account are (1) Period of realisation, (2) Technical, economical, and financial reliability of a firm.</p> <p>Use of electronic tendering</p> <p>No, this is not used frequently in Poland, nor will it soon be obligatory.</p>

<p>Portugal</p>	<p>Type of contract A private client is free to adopt any type of contract he wishes, but public contracts are defined by law. The most common system for tendering for public projects in Portugal is by public tender.</p> <p>Common system and criteria for tendering for public projects The normal criteria is lowest tender if tendering is restricted to invited competitors. If tendering is open to all, price is one of the factors, usually together with time, technical expertise and financial capacity.</p> <p>Use of electronic tendering Whilst electronic tendering is not used frequently in Portugal, it is developing fast and begins to be used.</p>
<p>Romania</p>	<p>Type of contract The usual procedure is to have separate contracts for the design and for the construction. At present, there is an increased interest to promote the system of contracting both the design and the construction work, based on a feasibility study.</p> <p>Common system and criteria for tendering for public projects In the private sector, the owner can commission a qualified engineer to design and plan the project and a construction company to construct the works. An engineer or sub-engineer can be commissioned to supervise the works. In the public sector, the owners are obliged to call for tenders, both for the design and for the construction. The overall control of the works is done usually by the owner's staff or can be passed to a consultancy firm.</p> <p>The owner cannot obtain the whole set of approvals and authorisations required for a project unless the documents are drafted by a professional engineer.</p> <p>In accordance with the Law No. 10, the design has to be checked by checkers accredited by the Ministry of Transportation, Constructions and Tourism. For special projects, the checking process can be commissioned to accredited experts. On 30th June 2003, 1,661 checkers, 823 experts and 4,230 technical responsible for the execution work were registered at the Ministry of Transportation, Constructions and Tourism for various areas of civil engineering.</p> <p>Use of electronic tendering The electronic tendering was introduced for public investments and procurement with good results leading to the extension of the method.</p>
<p>Russia</p>	<p>Type of contract A Private client is free to adopt any kind of contract he wishes. For the Public client – tendering is according to Municipal and State regulations.</p> <p>Common system and criteria for tendering for public projects The usual criteria is lowest tender. Other criteria that may be taken into account are the period of realisation, technical, economic and financial reliability of a company, quality of construction.</p> <p>Use of electronic tendering Electronic tendering is not used frequently.</p>

<p>Slovak Republic</p>	<p>Type of contract A client is free to adopt any type of contract in general. Public procurers are subject to the Act No. 523/2003 Coll. on Public Procurement. Private works are usually subject to a tendering process as well.</p> <p>There are contract regulations and legislation regulating the general contract as well as related aspects of the tendering process. The basic subjects in the contract in accordance with the legislation are: the subject of contract, the price and the date of performance. The legal background to a building contract is the Building Act No. 50/1976 Coll. as amended by subsequent regulations. Furthermore, there are the provisions of the Civil Code, the Trade Code, the Business Code, Act No. 523/2003 Coll. on Public Procurement, the Act No. 18/1996 Coll. on Prices, the Act No. 90/1998/Coll. on Construction Products, and so on.</p> <p>All these acts and civil codes are consulted by the government with the Slovak Chamber of Civil Engineers, the Association of Construction Entrepreneurs of Slovakia, with the unions, and, eventually, with other individual organisations.</p> <p>Common system and criteria for tendering for public projects The price is an important part of the public procurement process, but not decisive. The most common criterion for public projects is the lowest price/tender. Other criteria, such as the date of construction, quality, complexity of the delivery, constructional and technical solutions, may be taken into account.</p> <p>Use of electronic tendering Electronic tendering is used in Slovakia and it is not obligatory.</p>
<p>Slovenia</p>	<p>Type of contract The private client is free to accept any type of contract, whereas the public clients are obliged to call for tenders.</p> <p>There are different types of contracts in use: turn-key, fixed price, unit price contracts, pre-qualification, ...</p> <p>Common system and criteria for tendering for public projects Tendering for public projects must be done in accordance with Public Procurement Act and regulations.</p> <p>Lowest price is normally the only or one of the main factors in public tendering.</p> <p>What other criteria may be taken into account? Other criteria that may be taken into account are terms, reliability of company, quality.</p> <p>Use of electronic tendering Electronic tendering has not yet been introduced.</p>
<p>Spain</p>	<p>Type of contract In private business a client is free to adopt any type of contract. However, when the client is the Public Administration, the type of contract etc. is regulated by law in the 'Ley de Contratos con las Administraciones Publicas' (law on contracting with the public administration, mentioned also in Chapter 8).</p> <p>In the same law mentioned above and in Chapter 8, the various types of contracts are outlined. In 2004 the specifications for 'concession contracts' were included.</p>

<p>.I. Spain</p>	<p>Common system and criteria for tendering for public projects In Spain there are three types of tender: Subasta (auction) takes the lowest price; Concurso/subasta (tender/auction) the best technical offer at the lowest price; Concurso (tender) takes only into account the technical characteristics of the offer.</p> <p>Other criteria Delivery deadlines, quality, innovation in new technologies, environmental aspects, etc.</p> <p>Use of electronic tendering This is only in its initial phase.</p>
<p>Turkey</p>	<p>Type of contract There are Contract Laws regulating general contract related aspects and tendering progress. Similar to other engineering related regulations, Contract Laws have deficiencies which can cause mistreatment and injustice in the contracts. Private sector applications are free to be adopted in any type of contracts. However, there are criteria and regulations for public sector tendering process.</p> <p>Common system and criteria for tendering for public projects There are two types of tendering procedures: Lump sum tendering and Bill of Quantity (BOQ)-based tendering are commonly used in Turkey in tendering process. BOQ is the most applied type of tendering.</p> <p>There are two-staged tendering processes applied in many cases. After a prequalification stage, tendering stage is applied, which leads to elimination before tendering according to other criteria considered.</p> <p>Although there is not a legal constraint, the most commonly used method is still lowest tender evaluation. Recent regulations and legislation about the Contract Law achieved an important step by obliging every public office to provide a contract for each job, and, therefore, preventing any unjust decision. The lowest tender application will hopefully thin out through present regulations, and criteria such as experiment, financial situation, equipment availability, personnel, etc. will be considered at project basis.</p> <p>Calculation of tendering fee is free, whereas values out of normal ranges are questioned and examined. There are several methods to calculate the value, such as providing the BOQ and requesting the price, or directly providing the price and dealing with the contractor which is a seldom used process.</p> <p>Use of electronic tendering Electronic tendering has begun to be known, but it is not used for the civil engineering sector in Turkey. Providing the hard copy of the contract and all tendering process is an essential part of the system. Electronic government planning is not suitable for Turkey without dispute, an issue which has been discussed recently, and relatively, it is almost impossible to make electronic tendering obligatory.</p>
<p>United Kingdom</p>	<p>Type of contract There are no restrictions on the form of contract to be used for construction work. However, most would base their conditions on a standardised contract type.</p> <p>Joint Contracts Tribunal (JCT) Forms cover most building work and is the predominant contract form in building construction.</p>

<p>./. United Kingdom</p>	<p>The ICE Conditions of Contract for civil engineering construction are the basis for many contracts used in the UK. Under its terms a Chartered Engineer acts impartially within the terms of the Contract in administering the construction of the works and supervising the contractor to ensure compliance with the contract documents.</p> <p>The New Engineering Contract (NEC) is a legal framework of project management procedures designed to handle all aspects of the management of engineering and construction projects. It is in use across the spectrum of engineering and construction activities by a very wide range of clients, consultants and contractors. Its use encompasses projects both large and small, civil engineering and building, national and international.</p> <p>The NEC was developed by the Institution of Civil Engineers in the early 1990s with the aim of introducing a new form of non-adversarial form of contract strategy which would contribute towards the more effective and smoother management of projects. It comprises a suite of contract documents and range of support services comprising training, consultancy, software and a Users Group.</p> <p>Since the original launch of the main engineering and construction contract and subcontract, the NEC has been extended to include a professional services contract, an adjudicators contract and a short contract. Further extensions of, for example, a term services contract, are under development.</p> <p>Common system and criteria for tendering for public projects</p> <p>In the UK, tendering for public projects must be done in accordance with public procurement laws and regulations, in particular the EU acquis, but also domestic regulations and case law. Goods, works or services should be acquired by competition unless there are compelling reasons to the contrary. All public procurement is to be based on “value for money”, having due regard to propriety and regularity. Value for money is the optimum combination of whole-life cost and quality (or fitness for purpose) to meet the user's requirement. The purchaser would normally establish a set of “price and quality/purpose scores” to decide which bid gives best value for money.</p> <p>In general, public purchasers are free to agree the terms of the contracts they enter into, bearing in mind the advantages of using model terms and conditions developed in the light of collective experience and with which they and potential suppliers are likely to be more familiar.</p> <p>The use of PPP (public/private partnerships) and PFI (private finance initiatives) is increasingly used in the UK. Tenders for such projects must also follow public procurement rules.</p> <p>Use of electronic tendering</p> <p>The UK Government has launched a project called eProcurement, which aims at introducing the use of electronic methods in every stage of the purchasing process from identification of requirement through to payment, and potentially to contract management. Several government departments and public services are now using electronic tendering and “eAuctions” regularly (although still to a limited degree as far as civil engineering contracts are concerned).</p> <p>Apart from this, all public tenders will be published in the “Tenders electronic daily”, a supplement to the Official Journal of the European Union.</p>
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CHAPTER 10

FEE SCALES, SALARIES AND TAXATION

This chapter sets out the financial and economic environment in which the professional civil engineer operates. In some countries there is a clear range of fees for particular civil engineering works which is defined in law. In other countries tendering is carried out freely, in others there are guidelines which may be purely voluntary and put in place to assist the client.

The question we asked on salaries can only produce indicative answers from our members. The range of salaries across Europe varies enormously: it is important that such considerations are viewed in the context of the national economy. It is not possible within the scope of this review to compare salaries of other professionals in member countries. Many countries do not in fact carry out reviews of salaries paid by profession.

The VAT rate across Europe is generally similar although there are some interesting variations in some countries in relation to e.g. new construction or maintenance of buildings.

The questions asked of members were:

- 10.1 - *Is there a Scale Code of fees in your country? If so, is it approved by law?*
- 10.2 - *Is the tendering price free, or are there any rules for calculating this?*
- 10.3 - *Are civil engineers subject to normal national taxation?*
- 10.4 - *What do you believe is the average salary and percentage of tax paid on that salary in your country?*
- 10.5 - *What rate of VAT (Value Added Tax) is paid in your country?*

COUNTRY	
Croatia	<p>There is a fee scale approved by law, but it is applicable to public servants only. Other employers are free to define level of salaries for their employees by contract.</p> <p>An average gross salary is 7,000 kunas (or € 933). State tax on that salary ranges from 20-35%, local tax is 3%, while health and old age insurance is 40%. An average net salary is about 4,000 kunas (or € 533). All citizens including civil engineers fall under the same taxation system.</p> <p>The VAT rate currently applied in Croatia (2004) amounts to 22%. As of 2005, this tax will be reduced to 20% and it will be cancelled altogether for some products.</p>
Cyprus	<p>There is a scale code for fees but this is not covered by law. A new scale code is under discussion/consideration, with the aim to be approved by law.</p> <p>At the moment the tendering price is free and there are no specific rules for calculating this.</p> <p>Annual salaries of civil engineers range from Euro 11,000 to 55,000 depending on experience. The average annual salary is of the order of Euro 25,000 to 30,000. Civil Engineers are subject to normal national rates of taxation. Taxation rates in Cyprus are as follows:</p>
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Cyprus	<p>Up to CyP 10,000.00 income: zero tax Between CyP 10,000.00 - 15,000.00: 20% tax Between CyP 15,000.00 - 20,000.00: 25% tax Above CyP 20,000.00: 30% tax (1.00 CyP = 1.71 Euro)</p> <p>The VAT rate paid in Cyprus is 15%.</p>
Czech Republic	<p>Yes, a Scale Code of fees exists but it is a recommended scale only. It is not approved by law.</p> <p>The average salary for a civil engineer is Euro 550 a month, the tax paid on this is 35%. Civil engineers are subject to normal national rates of taxation. State taxation rate is 15-40%, health and pension insurance is about 33% (1/3 of this is paid by the employee and 2/3 by the employer).</p> <p>VAT (Value Added Tax) rate: From 1st January 2004, the rate of VAT was more or less set at 22%, it was subsequently changed to 19%.</p>
Estonia	<p>There is no Scale Code of fees in Estonia now.</p> <p>The tendering price is free.</p> <p>Civil Engineers are subject to normal rates of taxation.</p> <p>The average salary for young graduate civil engineer is approximately 450-600 Euro per month, the tax paid is 24% and 1% for unemployed insurance.</p> <p>The VAT rate in Estonia is 18%.</p>
Finland	<p>No, there is no Scale Code of fees in Finland. Such fee scale codes are prohibited by law.</p> <p>The tendering price is free, there are not rules for calculating this.</p> <p>The average salary for a civil engineer in 2002 was 4,000 € per month, the tax paid is approx. 35%. (Civil engineers are subject to normal national taxation.)</p> <p>VAT (Value Added Tax) is generally 22% but VAT on food and beverages amounts to 17 % and on publications 8%.</p>
France	<p>Average salary: Detailed information is published in CNISF documents on studies dealing with detailed conditions of employment, as well as detailed grids of salaries, on a yearly basis and in the Journal "Le Moniteur des Travaux Publics" which offers a yearly survey of salaries.</p> <p>As a rough indicator, it could be mentioned that an average annual salary for a young engineer is about Euro 28,000 in the Public Sector, and Euro 31,000 in the Private Sector.</p> <p>In regard to VAT applied for works in the construction sector, two rates are applied: 19,6% is the general rule, with an exception for maintenance of buildings, which is 5.5%.</p>
Germany	<p>Fee scale: Fees are calculated to an "official scale of fees for services by architects and engineers" (Honorarordnung für Architekten und Ingenieure – HOAI). This scale is based on law. It is published by the Government.</p> <p>The tendering price is free, but the actual price lists for a special work will be used. To achieve low prices one may calculate less man hours per special work. Very often 'special object-oriented' offers are used to highlight the experience and quality of the tendering company.</p>

<p>./. Germany</p>	<p>Yes, of course, civil engineers are subject to normal national taxation.</p> <p>The average annual salary for an employed civil engineer is Euro 50,000, the salary for a 'free' civil engineer may be twice that or more; the tax amounts to approximately 35% for all of them.</p> <p>The rate of VAT (Value Added Tax) is generally 16%; for publications, food, etc. it is only 7%.</p>
<p>Greece</p>	<p>Fee scales</p> <p>There is a Scale of Fees, rising according to the anticipated nature of the project. These fees are determined by Law 696/74 (Scale of Fees for Construction).</p> <p>The fee scale is unique but the budget to which it is applied is different for public (real design cost) and private (reduced budget) works.</p> <p>Fees are paid on submitting the project for approval (final phase). The civil engineer can ask the client for an advance that takes the place of the initial payment.</p> <p>Taxation</p> <p>Civil Engineers in private practice are subject to the following:</p> <p>a) Income tax depending on the legal form and the level of income. For consulting engineers 30% of the gross income is considered net and the tax scale can reach 40% of that. (A tax of 10% on remuneration for each project to be paid in advance). Contracting firms are considered to have a 10% of net income on their overall value of works and the tax scale can reach 45% of that. (A tax of 3% on each payment bill to be paid in advance)</p> <p>b) deduction for the C.T.G.: 2% of the remuneration;</p> <p>c) deduction for the T.S.M.E.D.E. (Pension Fund for Engineers and Public Works Contractors); 3% of the remuneration.</p> <p>In the case of employees, deductions are imposed for a), b) and c) as well as for the I.K.A. (Social Security) which offers sickness benefit provided they are not already insured with K.I.T. (Medical/pharmaceutical assistance Fund for engineers) nor with the Social Security for the Public Servants. Salaried engineers are entitled to unemployment benefit only after 50 days salaried employment. Deductions on engineer's fees are made before the issue of building permission.</p> <p>Rate of VAT (Value Added Tax)</p> <p>V.A.T. in Greece amounts to 19% for engineering services and for work constructions.</p>
<p>Hungary</p>	<p>There is a recommended Scale code of fees in Hungary. However, it is not approved by law.</p> <p>The tendering price is free, there are not rules for calculating this.</p> <p>The average salary in Hungary is Euro 1,200 per month of which 40% is paid in tax. (Civil Engineers are subject to normal rates of taxation).</p> <p>VAT (Value Added Tax) is 25% (with some exceptions).</p>
<p>Ireland</p>	<p>Fee scale: There is no scale code of fees in Ireland as this is regarded as being anti-competition.</p> <p>Tendering: The tendering price is free and thus there are no rules to calculate this.</p> <p>Average salary: This is too varied to respond. The IEI produces a salary</p>

<p>./. Ireland</p>	<p>review booklet to provide details for members. As an example the 2001 IEI Salary Survey revealed that average salary levels of ordinary members of the Institution of Engineers of Ireland are between Euro 20,000-25,000 for those with less than 1 years' employment, nearly Euro 30,000 for those with 1-2 years employment, approximately Euro 35,000 for those with 3-5 years' employment and in the region of Euro 45,000-50,000 for those with 6-10 years' employment. Civil engineers are subject to normal national rates of taxation</p> <p>VAT (Value Added Tax): VAT rates paid in Ireland are 13.5%, and 21%.</p>
<p>Italy</p>	<p>Scale code of fees: Minimum fees of civil and environmental engineers are provided for by the Decree of the Ministry of Justice dated 4th April 2001. They are binding. Public Administration can enjoy a "discount" not exceeding, however, 20% of the minimum fee computed according to the updated table rates of the national fees in force.</p> <p>Taxation: Civil and environmental engineers pursuing free profession are subject to the taxation regime common to any other profession.</p> <p>VAT Rate: The 'Imposta sul Valore aggiunto' (IVA - <i>Value Added Tax - VAT</i>) applied to the Engineering professional activities amounts to 20%, like that applied to any other professional.</p>
<p>Latvia</p>	<p>Fee scale</p> <p>There is no Scale Code of fees in Latvia's building industry at present (for state and municipality enterprises). For private consultants rough fees exist but these are not approved by law.</p> <p>Tendering price</p> <p>It is free. The strict rules for calculating tendering price from the client side do not exist in Latvia. Client (state and municipality enterprises) usually do it to plan finances.</p> <p>Taxation</p> <p>The social tax is 33,09 %. 24,09% is paid by the employer, 9% is paid by the employee.</p> <p>Average annual salary</p> <p>On average the annual salary is 7,000 lats or Euro 12,000.</p> <p>Rate of VAT (Value Added Tax)</p> <p>VAT is 18 % in the building industry. The tendering price includes VAT.</p>
<p>Lithuania</p>	<p>There is no Scale Code of fees in Lithuania at present.</p> <p>For a tender, primary tendering price is calculated and tendering companies propose their own prices. There is still no electronic mandatory tendering, however it starts to be applicable.</p> <p>Civil Engineering is a subject to normal national rates of taxation.</p> <p>The VAT Rate is equal to 18 %.</p>
<p>Poland</p>	<p>There is not a Scale Code of fees in Poland, however, a non-obligatory register exists. It is not approved by law.</p> <p>The tendering price includes VAT.</p> <p>Civil engineers are subject to normal national taxation.</p> <p>In 2003, the average salary was approximately Euro 600 per month.</p>

./. Poland	<p>Percentage of tax on salaries: 19% up to Euro 9,200 annual income, 30% up to Euro 18,500 annual income, and 40 % above Euro 18,500 annual income.</p> <p>The VAT rate (Value Added Tax) applied in Poland is: 7 % - building, constructing activity, materials; 22 % - designing activity, services.</p>
Portugal	<p>Portugal does have a Scale Code of fees for design, based on a taxation of the estimated value of the work. It is approved by law, but discounts are encouraged.</p> <p>The tendering price is free, subjected to market laws.</p> <p>Civil engineers are subject to normal national rates of taxation.</p> <p>An average annual salary for an engineer with 5 years' experience may be €35,000 and the percentage of tax paid on that salary is around 30%.</p> <p>In Portugal the rate of VAT (Value Added Tax) paid is 19%.</p>
Romania	<p>Scale Code of fees: The scale fees are established within each company. For public servants, scale fees are established at national level by the decision of the government, taking into account the inflation rate and the reduced level of salaries.</p> <p>Minimum salaries are regulated by law</p> <p>Tendering system: For public works, the tendering system is compulsory. The conditions of participation to tenders are stipulated by law, which also defines the organisation, the eligibility criteria, guarantees required etc. In the private system, for important works tenders are usually organised with selected participants.</p> <p>The minimum salary in the construction industry is about 100 Euro per month, the average salary about 250 Euro per month. However, when judging these figures, one should consider the level of prices for commodities and services which, as compared to the level in EU is roughly in the ratio 1/2.5... 1/3.</p> <p>Taxation. The present system of taxation in Romania is rather varied and complex and takes into account the size of the enterprise, the field of activity, the type of activity. According to the opinion of the general public, taxation is considered to be high. For instance, 32%... 35% of the salaries fund represents social taxes supported by the employer. At the same time the employee contributes about 17% for the same kind of taxes from his/her salary. The taxes on the salaries are, depending on the amount of the salary, between 18% and 40%. Some deductions are, however, made for special social conditions. The tax on profit to be paid by enterprises is 25%.</p> <p>At present the rate of VAT in Romania is 19%.</p>
Russia	<p>There is a fee scale approved by law, but it is applicable to public employees only. Other employers are free to define level of salaries for their employees by contract.</p> <p>The monthly gross salary starts from Euro 300 - 500. The company has to pay taxes on salary about 26%, which includes State tax, local tax, health and old age insurance. From his gross salary an employee has to pay independently 13% tax of the amount.</p> <p>The VAT rate currently applied in Russia is 18 %.</p>
Slovak Republic	<p>Scale Code of Fees does not exist within the Slovak Chamber of Civil Engineers. It is not approved by law. Fees for the services are negotiated between the seller (natural/legal person) and the buyer (investor/other) who is ordering the services.</p>

	<p>The tendering price is free and subject to the Act No. 18/1996 Coll. on Prices.</p> <p>The average gross salary for an employed authorised civil engineer is approximately Euro 600 per month; and approximately Euro 500 per month for an unauthorised civil engineer. The salary depends on the negotiation between employee and employer.</p> <p>Civil engineers are subject to normal national taxation. Incomes of all subjects (individuals, legal entities, foreign individuals and entities and other entities) in Slovakia are taxed at one linear 19 % tax rate.</p> <p>The rate of VAT is 19% in Slovakia.</p>
<p>Spain</p>	<p>Fee scale: There is only an indicative scale of fees, solely used as a means of information to clients, but in no way binding.</p> <p>Tendering price: Only indicative rules except for maximum total price of the offer.</p> <p>Taxation: Yes, civil engineers are subject to normal national taxation.</p> <p>Average annual salary: Annually around Euro 60,000, 30% tax paid.</p> <p>Rate of VAT (Value Added Tax): 16%.</p>
<p>Turkey</p>	<p>Fee scales: In Turkey, there are specified salary scales in law, for public employees, referred to their profession, job experience, and some other detailed criteria. There is also a minimum fee value per worker, determined by government. Private sector is not obliged by any fee specification. Public sector has to determine the fee related to the minimum by-law value.</p> <p>Tendering: Both public and private sector engineers are subjected to normal taxation, which must be paid salary basis by the employers. Average gross salary of civil engineers in Turkey is Euro 1,200, of which 37 per cent is taxes.</p> <p>The rate of VAT varies according to the application and the product between 1-25 per cent. General consumption materials and general construction materials are subjected to 18% VAT.</p>
<p>United Kingdom</p>	<p>There is no standard fee scale in the UK, and no law governing either competition or fees. However, the Association of Consulting Engineers has recommended a scale of fees to its members, but there is no obligation to follow it.</p> <p>The tendering price is free, but will be governed by specifications in the tender. As there is a lot of competition for design of projects, bidders will normally not make excessive calculations.</p> <p>The average annual gross earnings for all those classified as professional engineers and technologists were £32,086 in the tax year ending April 2001. By contrast, the average annual gross earnings (including overtime) for registered Chartered Engineers in the year to April 2001 were £49,997 according to the Engineering Council 2001 Survey of Registered Engineers earnings, tax year ending April 2002.</p> <p>Civil engineers are subject to normal taxation. For an income of £32,000, the total tax rate (income tax and national insurance contribution) would be approximately 25%. For an income of £50,000, the total tax rate would be approximately 34%. On an individual level, the total tax rate may vary depending on entitlement to tax credits etc. (Source: Inland Revenue)</p> <p>VAT rate: VAT is payable on all forms of construction work at a rate of 17.5%.</p>

CHAPTER 11

INSURANCES AND PROFESSIONAL LIABILITY

The question of liability is one which has often been raised in discussion amongst European Council of Civil Engineer members as a result of the different legal regimes for liability in member countries. In the 1990s ECCE was actively involved in discussions in the 'G.A.I.P.E.C.' group which considered Commission proposals for a pan-European framework for construction liability. Following the results of a Europe-wide survey the Commission later abandoned this proposal.

The questions asked of members in relation to insurances and professional liability were:

- 11.1 - *Is there mandatory insurance for civil engineers in your country?*
- 11.2 - *Who is responsible for professional liability insurance?*
- 11.3 - *Do companies have their own liability insurances?*

COUNTRY	
Croatia	There are no insurances at the company level except insurance of the employees in case of a work accident.
Cyprus	Insurance for professional liability is not mandatory for civil engineers in Cyprus. Some design firms however, have professional liability insurance. Government Departments and Public Organisations require the civil engineering consultants for certain specialised projects to have professional liability insurance.
Czech Republic	Yes, insurance is mandatory for civil engineers Individually, engineers and technicians and the Czech Chamber of Certified Engineers and Technicians are responsible for liability insurance. Companies have their own liability insurance.
Estonia	There is no mandatory insurance for civil engineers. Companies have their own liability insurances.
Finland	There is no mandatory liability insurance for civil engineers in Finland. Many professional organisations, such as RIL, have personal liability insurance for their members working as employees included in the membership fee. As liability insurance is not mandatory, there is no one particularly responsible for it. Companies have their own liability insurance, which to a certain extent also covers professional liability.
France	In general terms, Public Authorities do not take out any insurance, assuming risks by themselves. In the Private sector, firms take out insurance, not the engineers as employees.

<p>./. France</p>	<p>Professional liabilities are defined under Civil Code law, and the various Workers Acts and Regulations. Insurances are compulsory (for construction only) for all participants including the owner. In most cases, construction firms are covered by a “General Policy”. When special risks are involved, the clients may contractually oblige the Contractors to take out “Special Policies”.</p> <p>Mandatory insurance includes:</p> <ul style="list-style-type: none"> - civil responsibility for damages and to people during the construction period, - “décennale” professional insurance (10 years liability insurance) for damages after the hand-over of the works.
<p>Germany</p>	<p>Some federal states require a Professional Liability Insurance for architects and engineers who sign plans and drawings to obtain building permission.</p> <p>Each (civil) engineer is responsible by himself for professional liability insurance.</p> <p>Companies do have their own liability insurance.</p>
<p>Greece</p>	<p>In Greece there is no insurance cover for civil engineers (or engineers of any other discipline) against accidental professional mishaps. Anyone seeking insurance must approach a private insurance organisation with onerous conditions. There is a recent discussion concerning a new framework law for private works that will establish a mandatory insurance of engineer’s professional liability. Companies and contractors dealing with public works are obliged by contract terms to insure the construction risks and their liability.</p>
<p>Hungary</p>	<p>There is no mandatory insurance for civil engineers in Hungary.</p> <p>No-one is responsible for professional liability insurance.</p> <p>Companies may opt to have their own liability insurance.</p>
<p>Ireland</p>	<p>There is mandatory insurance for civil engineers.</p> <p>Companies and individuals are responsible for professional liability insurance.</p>
<p>Italy</p>	<p>Minimum fees of civil and environmental engineers are provided for by the Decree of the Ministry of Justice 4 April 2001. They are binding. Public Administration can enjoy a “discount” not exceeding, however, 20% of the minimum fee computed according to the updated table of rates for the national fees in force.</p> <p>Civil and environmental engineers pursuing a ‘free profession’ are subject to the taxation regime common to any other profession.</p> <p>The Imposta sul Valore aggiunto (IVA - <i>Value Added Tax</i> - VAT) applied to the engineering professional activities amounts to 20%, like the one applied to any other professional.</p>
<p>Latvia</p>	<p>There is no mandatory insurance for civil engineers in Latvia.</p> <p>Companies should look for their own liability insurances.</p>
<p>Lithuania</p>	<p>There is no mandatory insurance for civil engineers. Companies seeking insurance must approach private insurance organisations.</p>

<p>Poland</p>	<p>There is mandatory insurance for civil engineers in Poland.</p> <p>Individually engineers and the Polish Chamber of Civil Engineers are responsible for professional liability insurance.</p> <p>Companies do have their own liability insurances.</p>
<p>Portugal</p>	<p>There is no mandatory insurance for civil engineers in Portugal but the Ordem dos Engenheiros provides a basic insurance for all its members.</p> <p>Each engineer is responsible for his or her own professional liability insurance.</p> <p>Only a few companies have their own liability insurance.</p>
<p>Romania</p>	<p>In Romania there is no mandatory insurance for civil engineers at present. Liability for defects in construction or damage caused thereby is regulated by common law.</p> <p>Direct responsibilities are defined in the Law no. 10 for the main parties involved in civil engineering projects i.e. consultants, contractors, owners, checkers, experts, etc.</p>
<p>Russia</p>	<p>There is no mandatory insurance for civil engineers.</p> <p>Companies have their own liability insurances.</p>
<p>Slovak Republic</p>	<p>According to the Act No. 138/1992 Coll. (§ 12) on Authorised Architects and Authorised Civil Engineers as amended by subsequent regulations, authorised civil engineers are obliged to buy liability insurance - regarding the damage that may arise in connection to their activities and activities of their employees. They are obliged to insure themselves in 10 days after their registration to the Register of Authorised Civil Engineers and notify the Slovak Chamber of Civil Engineers of doing so. Unauthorised civil engineers are recommended to have liability insurance as well. Furthermore, the liability arises also from the Labour Code.</p> <p>Authorised civil engineers can be insured individually or through the Slovak Chamber of Civil Engineers.</p> <p>Companies have their own liability insurances.</p>
<p>Slovenia</p>	<p>Insurance for professional liability is not mandatory for civil engineers.</p> <p>The company is responsible for professional liability insurance.</p> <p>Companies do have their own liability insurance, according to requirement of Construction Act.</p>
<p>Spain</p>	<p>There is no mandatory insurance in Spain, only when civil engineers are commissioned to carry out works for the Public Administration. However, in practice all practicing civil engineers hold such a professional public liability insurance up to the amount of 151,000 euros (302,000 euros for certified projects) per member through their (mandatory) membership of the Colegio de Ingenieros de Caminos which is the holder of the insurance.</p> <p>Construction and consulting companies underwrite their own insurances.</p>

<p>Turkey</p>	<p>All of the risk insurance system is applied on a project basis, for both public and private sectors. Professional liability insurance has not been used in Turkey yet, but the studies are continuing. It would possibly be valid in two-three months time from the time of writing (<i>i.e. by autumn 2004</i>). Company liability insurances are on a voluntary basis, which leads to determining their own liability insurances.</p>
<p>United Kingdom</p>	<p>In the United Kingdom consultants and contractors in civil engineering are responsible for their own insurance arrangements through private insurance firms.</p> <p>There are no legal or statutory requirements to take out insurance, except for building certification, but in practice every engineer would ensure that he is covered against claims of negligence for at least 15 years from the date of completion of project. Also, most construction contracts require insurance cover to be taken out for all risks related to the project, including employer's liability, third party liability etc.</p>

CHAPTER 12

SOCIAL SECURITY

The aim of this section was to find out what social benefits are available to professional civil engineers across Europe and to find out if national associations play a part in relieving problems associated with unemployment or old age.

The questions asked of member organisations were:

- 12.1 - *Do you pay social security yourself or does your employer pay it?*
- 12.2 - *Are there any special unemployment funds that can be accessed by civil engineers?*
- 12.3 - *Are there compulsory contributions for health service and pension in your country?*

COUNTRY	
Croatia	<p>Social security payments Social security is paid by the employer. It covers both health insurance and old age insurance. Additional health insurance, including additional health benefits, may be paid directly by the employee.</p> <p>Unemployment funds Some special unemployment funds for civil engineers may exist at the level of the workers' union in the construction industry. Other funds are at the state level, and are equal for everyone.</p> <p>Health and pension contributions Health and old age insurance contributions are obligatory.</p>
Cyprus	<p>Social security payments is paid by both the employer and the employee. Social security provides unemployment funds which are accessible by civil engineers.</p> <p>Unemployment funds There is a compulsory contribution for pension but not for health service.</p> <p>Health and pension contributions A National Health Service plan has been approved by the House of Representatives but has not yet been put into effect. A compulsory contribution for health service will be imposed on all employees when the health plan is put into effect.</p>
Czech Republic	<p>Social security payments Payment is divided between both employer and employee.</p> <p>Unemployment funds Only a general unemployment fund exists.</p> <p>Health and pension contributions Yes, there are compulsory contributions for health service and pension in the Czech Republic.</p>

<p>Estonia</p>	<p>Social security payments The social security contributions are paid by the employer and amount to 33% (20% social security and 13% sickness benefit society).</p> <p>Unemployment funds -</p> <p>Health and pension contributions The Estonian pension system includes compulsory contribution depending upon the age of persons.</p>
<p>Finland</p>	<p>Social security payments Payment is divided between both employer and employee.</p> <p>Unemployment funds There are general unemployment funds. Civil engineers usually are members of an Unemployment Fund for Engineers, Architects and Economists.</p> <p>Health and pension contributions The health service is included in the government and municipal tax but payment for pension is collected from salary by the company and forwarded to a pension fund.</p>
<p>France</p>	<p>Social security payments All Social Security benefits are available for engineers. Complementary insurance is available on a voluntary basis through a large number of "Sociétés Mutuelles" which have a legal status.</p> <p>Unemployment funds Unemployment funds are available for engineers as for any other company employees.</p> <p>Health and pension contributions Contributions for health service and pension are compulsory. They are paid partly by employers, partly by employees, under conditions fixed by law. There are also "Caisses de Retraites Complémentaires" (Supplementary Pension Funds) which are part of the legal pension system. Contributions are made by both the employer and the employees.</p>
<p>Germany</p>	<p>Social security payments 50% of social security is paid by the employer and 50% by the employee.</p> <p>Unemployment funds There are no special unemployment funds that can be accessed by civil engineers, only the general unemployment funds which exist for every working person.</p> <p>Health and pension contributions With regard to compulsory contributions for health service and pension, the social security of employees in Germany is guaranteed by legislation. Self-employed engineers have to make their own arrangements for social security. Members of the chamber of engineers are normally a member of the engineers' supply network for retirement, to which he or she must pay contributions.</p>

<p>Greece</p>	<p>Social security payments</p> <p>All qualified engineers and architects, as well as a few categories of technical personnel without diploma (above all public works contractors), are members of the T.S.M.E.D.E. and they have the right to a pension that is granted under certain conditions. K.I.T. benefits are also available for those of its members who are not insured by the organisations in which they work. The funds provide for pensions but not for sickness or family allowances. From 1st July 1979, a Special Account for auxiliary pensions was created and this gives an auxiliary pension to all members who have no other principal pension than the basic one of T.S.M.E.D.E. (for retirement only).</p> <p>Health and pension contributions</p> <p>The subscriptions to the Retirement Branch and to the Special Account are calculated on percentages of the basic salary of a civil servant of the second grade (Director a). The practising professional pays 3% of this salary monthly and the salaried employee 4% . The employer also pays a subscription for the salaried employee. There are other social resources for funding, for example a small percentage is collected from fees on projects carried out by engineers.</p> <p>As regards Health, there is a monthly subscription fixed at 700 drs, while the employer also pays a certain amount for the salaried. The subscriptions are payable quarterly. If a member does not pay his subscription on time he is surcharged for interest on the delay; the subscriptions are calculated on current prices (all based on the salary of a second-grade civil servant) with an adjustment every three months.</p> <p>No one is recognised as exempt from subscriptions to the retirement fund.</p> <p>The total payment in subscriptions provides the basis for the age-related right to retire, for which a reduced pension is paid when the insured person has finished 20 years of service, and a full pension for 35 years of insurance, increased for 40 years which represents the maximum. The sum at retirement after 35 years' insurance reaches 80% of the basic salary of a second-grade civil servant. The Special Account will reach its full level of operation in about 25 years, when it will give a retirement pension on the same level as that which is basic in the branch for Retirement and an End of Service Indemnity.</p> <p>It should be noted that T.S.M.E.D.E, the Retirement Fund of Engineers, has the right also to issue letters of guarantee for its members.</p> <p>Apart from that, the laws of the free market are in force, and in consequence a civil engineer can insure himself with a private insurance agency.</p>
<p>Hungary</p>	<p>Social security payments</p> <p>The amount of social security paid is shared by the employer and the employee.</p> <p>Unemployment funds</p> <p>There are no special unemployment funds that can be accessed by civil engineers.</p> <p>Health and pension contributions</p> <p>There are compulsory contributions for health service and pension in Hungary.</p>

Ireland	<p>Social security payments A percentage of the amount is paid by both the employer and the employee.</p> <p>Unemployment funds There are no special unemployment funds that can be accessed by civil engineers in Ireland.</p> <p>Health and pension contributions There are compulsory contributions for health service and pension in Ireland.</p>
Italy	<p>Social security payments The national health service and the pension system are both compulsory institutions in Italy. The national health service gives the same treatment to all citizens through the public health structures. The contributions paid for these services vary according to income.</p> <p>Unemployment funds Only workers insured against involuntary unemployment who were dismissed may receive an unemployment indemnity provided that they have paid at least two years of insurance or one year in the two year period prior to dismissal. This indemnity is paid for 180 days. Since 1st January 2001, it is paid for up to nine months when the unemployed person is over the age of 50. For the construction sector, there is a special treatment which lasts 90 days and, under particular circumstances it may last up to 18/27 months.</p> <p>Health and pension contributions The compulsory contributions for the health and pension service for employed civil engineers are paid partially by the workers and partially by the employers. The amount of the contribution is proportional to the wages and varies according to the category of contract. Free professionals pay 6.6% of their net income to the national health service up to Lit. 40,000,000, plus 4.4 % if their net income goes from Lit. 40,000,000 to 150,000,000. As concerns the social security, disability and pension system, the individual compulsory contributions amount to 6% of professionals' net income. The supplementary contributions are to be added to these sums. Engineers, together with architects, have also a private system (Inarcassa) to which they have to pay compulsory contributions.</p>
Latvia	<p>Social security payments Social security payments is paid by both employee (9%) and employer (24.09%).</p> <p>Unemployment funds Unemployment funds exist and can be accessed by civil engineers.</p> <p>Health and pension contribution There are compulsory contributions for health service and pension in Latvia.</p>
Lithuania	<p>Social security payments</p> <p>Unemployment funds</p> <p>Health and pension contributions</p>

<p>Poland</p>	<p>Social Security Payments This depends on the form of employment, but usually the employer pays it.</p> <p>Unemployment funds There are special unemployment funds that can be accessed by civil engineers.</p> <p>Health and pension contributions There are compulsory contributions for health service and pension in Poland.</p>
<p>Portugal</p>	<p>Social security payments In Portugal 11% of social security is paid by the employee and 24.5% is paid by the employer (this includes health service and pension provisions).</p> <p>Unemployment funds There are no special unemployment funds that can be accessed by civil engineers, but there are unemployment funds for all the employees.</p> <p>Health and pension contributions There are compulsory contributions for health service and pension in Portugal.</p>
<p>Romania</p>	<p>Social security payments The social security of employees is guaranteed by legislation. As their contribution for their employees' pensions, employers pay: contribution to social security 24.5%, health security 7%, unemployment 3.5%</p> <p>Each employee also pays the contribution to social security 9.5%, to health security 6.5%, and to unemployment 1%.</p> <p>Freelance (self-employed) engineers have to make their own arrangements for social security.</p> <p>Unemployment funds There are no special unemployment funds that can be accessed by civil engineers. Civil engineers are covered by statutory contributions outlined above.</p> <p>Health and pension contributions With regard to compulsory contributions please refer to 'Social Security' above.</p>
<p>Russia</p>	<p>Social security payments Social security is paid by the employer. It covers both health insurance and old age insurance. Additional health insurance, including additional health benefits, may be paid directly by the employee.</p> <p>Unemployment funds Are at the state level, and are equal for everyone.</p> <p>Health and pension contributions Health and old age insurance contributions are obligatory.</p>

<p>Slovenia</p>	<p>Social security payments</p> <p>Social security is paid by employer. It covers both health insurance and old age insurance. Additional health insurance, including additional health benefits may be paid by the employee.</p> <p>Unemployment funds</p> <p>Some special unemployment funds for civil engineers may exist at the level of the workers union in construction industry. Other funds are at the state level and are equal for every one.</p> <p>Health and pension contributions</p> <p>Health and old age insurance contribution are obligatory.</p>
<p>Slovak Republic</p>	<p>Social security payments</p> <p>Social security payments are divided between both employee and employer.</p> <p>Unemployment funds</p> <p>Only a general unemployment fund exists in Slovakia.</p> <p>Health and pension contributions</p> <p>The contributions for health service and pension are compulsory in Slovakia. There also exists the possibility of supplementary pension insurance.</p>
<p>Spain</p>	<p>Social security payments</p> <p>Social security is paid by the employer and by the employee.</p> <p>Unemployment funds</p> <p>There are no especial unemployment funds to be accessed by civil engineers, only those received from the State (public pension funds).</p> <p>Health and pension contributions</p> <p>Health and pensions contributions are compulsory and they are paid through the Social Security, one part to the health service and one part to the public pension fund.</p>
<p>Turkey</p>	<p>Social security payments</p> <p>Fee scales are determined including the social security fees. Employers pay the fee from the gross salary as mentioned in Chapter 10. The net payment is distributed.</p> <p>Unemployment funds</p> <p>An unemployment fund system is very new in Turkey, and has started to be applied recently, just for the 'labourer status' professionals or civil engineers who have Social Security records. (Employees are classified in legislation as labourer, official, or tradesmen, where the job standards, payments, insurance, funds and such conditions are specified in related statutes.)</p> <p>Health and pension contributions</p> <p>Due to the dense population of Turkey, the Social Security Organisation has an inefficient health service system, although it can not be valued to be insufficient on a quality basis.</p>

United Kingdom	<p>Social security payments</p> <p>All employees pay the standard National Insurance contribution for social security, as do employers.</p> <p>Unemployment funds</p> <p>There are no special unemployment funds. Civil engineers may get unemployment benefit or jobseeker's allowance in accordance with general rules.</p> <p>ICE operates a Benevolent Fund for its members. The fund can assist members who are suffering from an accident, illness, bereavement, and the infirmities of old age or financial misfortunes. Assistance may include a regular grant or one-off loan, advice on state benefits and other forms of government aid, contribution to nursing home or residential care home fee shortfalls.</p> <p>Health and pension contributions</p> <p>The National Insurance contribution is compulsory for anyone with an income.</p>
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CHAPTER 13

CIVIL ENGINEERING PRACTICE

The aim of this chapter is to indicate who the principle employers are in each member country. Is it the private sector employer or public sector? In what fields of work are engineers employed on the whole? Where possible, members were asked to cite official statistics to demonstrate this.

The questions asked of members to obtain this information were:

13	<i>In which sectors do civil engineers work in your country? Do you have figures to indicate the percentage of engineers in the following?</i>
13.1	<i>- Private sector: consulting, contracting, materials industry</i>
13.2	<i>- Public sector: local authorities and national authorities</i>

COUNTRY	
Croatia	Civil engineers are employed in all sectors of the Croatian economy. About 70% of all engineers are currently employed in the private sector. The percentage of engineers working in public sector (local and national authorities, national water management companies, national power management companies, national highways and railways authorities) is estimated at 20%.
Cyprus	Civil engineers work mostly in the building industry either as design engineers in private design offices or as construction engineers in construction companies or land development companies. Civil engineers are also engaged in the design and construction of highways, water works and waste water treatment works. The majority of the engineers work in the private sector and only a relatively small proportion work in the public sector. Although we have no exact figures, the percentage of working in the public sector is between 10 to 15%.
Czech Republic	Civil engineers work in all sectors. The percentage of civil engineers in the Private Sector is approx. 75%, in the Public Sector around 25%.
Estonia	Civil engineers work in both the private and the public sectors in Estonia. We do not have figures to indicate the percentage of engineers in private and public sectors, but there are a few engineers working as technical inspectors and officials of local and national authorities.
Finland	Results from a member survey carried out in 2002 indicate the following: - Private sector: consulting (28 %), contracting (16 %), materials industry (6 %), other (education, R&D, maintenance, property market, ITC, quality control, etc., 13 %), - Public sector: local authorities (16 %) and national authorities (21 %).

<p>France</p>	<p>In the various fields of the construction sector, civil engineers are involved in:</p> <p>Buildings structures; building finishings; bridges and Structures; earthworks; foundations; underground works; highways and other transport infra-structures; electricity supply; utilities: water supply, sewers and other urban networks and also facilities: the functioning and management of existing buildings.</p> <p>The building sector involves around 1,000,000 workers, 7% of these are managerial staff, of which 2/3 are Engineers.</p> <p>The Public Works sector involves around 250,000 workers, 9% of them are managerial staff, of which 2/3 are Engineers.</p>
<p>Germany</p>	<p>Private sector: consulting, contracting, materials industry: approximately 80%.</p> <p>Public sector: local authorities and national authorities: approximately 20%.</p>
<p>Greece</p>	<p>Civil engineers are working in all fields of the engineering profession, as consultants, contractors, management, administration, industry, etc., and under all types of working conditions: as businessmen, contractors, self-employed, employees in private sector and public servants.</p> <p>There is no special legislation for civil engineers they must act according to the civil code, and working legislation.</p> <p>There is a collective agreement on conditions of employment for salaried civil engineers signed by A.C.E.G. and the employers' organisations.</p> <p>According to recent statistical data (2004), civil engineers have the following working status:</p> <ul style="list-style-type: none"> 30.5% are self-employed in liberal profession 27.9% are public servants mostly in permanent status 22.0% own small or big consulting or contracting firms with employees 17.8% are employees in the private sector 1.8% are working in other fields.
<p>Hungary</p>	<p>Civil engineers in Hungary are employed in both the private and public sectors within Hungary.</p> <p>They are involved in design, and in the construction industry as well as in the work of various national authorities.</p> <p>There are no figures available to indicate the percentage of involvement of engineers in the public or private sector.</p>
<p>Ireland</p>	<p>Civil engineers in Ireland are employed in all sectors including information and communications technology.</p> <p>80% are employed in the private sector (consulting, contracting or material industry) whilst</p> <p>20% are employed in the public sector by local or national authorities.</p>
<p>Italy</p>	<p>Civil engineers in Italy are distinguished from architects, even though their professional duties are very similar.</p> <p>Among the civil and environmental engineers not practising as free professionals, 26% are employed in private companies, whilst 74% of civil and environmental engineers are employed in a public body.</p>

Latvia	Civil engineers are employed in all sectors. There are big differences in different regions in Latvia from 5.6% to 28.3% in state and municipality financed contracts (94.4%-71.7% - private). On average 20.6% are local and state authority financed and 79.4% - private (2003/2004 year figures).
Lithuania	The activities of civil engineering have a very broad spectrum, i.e. the design and execution of construction works, consultancy and expertise. The State sector still exists. However, there is a trend for the State sector to be turned more and more into private companies.
Poland	In Poland civil engineers work in both the Private Sector: (i.e. consulting, contracting, materials industry) and the Public Sector: local authorities and national authorities. The percentage is considered to be: 60-70%: Private sector 30-40%: Public sector
Portugal	Civil engineers work in all sectors in Portugal. An estimate of the proportion in the private sector compared to the public sector would be: Around 80%: Private sector: consulting, contracting, materials industry. Around 20%: Public sector: local authorities and national authorities.
Romania	In Romania there is an evolution in the division between public and private sector employment for civil engineers. Big design institutes, belonging to various ministries or to city and district councils, which handled almost all the design activity before 1990, have reduced their size considerably in the period of 2002-2003 and some have turned into private companies. Similarly, few of the big contracting companies retained their previous structure (notably those involved in public projects, like the Construction Company of the Ministry of Transportation). At present, there is an increasing trend towards small specialist companies, both in the consultancy and in the construction field. Thus of a total of 10,521 economic agents (firms) which reported in 1999 that their basic activity was in construction, 291 (2.8%) had over 250 employees; 1,066 (10.1%) between 50 and 249 employees and 9,164 (87.1%) under 50 employees. Local authorities usually employ their own engineers, although they may also require the services of private firms.
Russia	Civil engineers work in all sectors. The percentage of civil engineers in the Private Sector is approximately 70%; in the Public Sector this figure is around 30%, including Municipal, Regional and State officers.
Slovak Republic	Civil engineers cover a wide range of services. They work mainly in the construction sector but their services are practically required in all sectors. Civil engineers work mainly in the private sector, since more than 90% of enterprises in the Slovak building sector are private. Generally estimated, more than 70% of civil engineers work in the private sector and the percentage of civil engineers in the public sector is approximately 30%.

Slovenia	<p>Civil engineers are employed in all sectors of the Slovenian economy.</p> <p>We do not have exact data. Based on our judgement and experience, about 75% of all engineers work in the private sector, the remaining 25% are employed in the public sector.</p>																						
Spain	<p>At end December 2004, statistics of sectors in which civil engineers work in Spain. These show the figures from the categories into which the Colegio divides all its members:</p> <table data-bbox="399 510 1337 945"> <tr> <td>Ministry of Public Works, Environment, other ministries and dependent entities:</td> <td>6.65 %</td> </tr> <tr> <td>Local and autonomous administrations and dependent entities:</td> <td>6.50%</td> </tr> <tr> <td>Teaching and research</td> <td>3.00%</td> </tr> <tr> <td>Construction and related industries</td> <td>34.15%</td> </tr> <tr> <td>Practising professionals and Consulting</td> <td>30.00%</td> </tr> <tr> <td>Transport, Communication and new technologies companies</td> <td>1.80%</td> </tr> <tr> <td>Energy, water and environmental companies</td> <td>2.93%</td> </tr> <tr> <td>Real Estate, Finance and Insurance companies</td> <td>2.65%</td> </tr> <tr> <td>Various (apart from 'other industries' this percentage includes retired, jobless, most recently graduated etc.)</td> <td>2.22%</td> </tr> </table> <p>Private Sector: 84% and in Public Sector: 16%.</p>	Ministry of Public Works, Environment, other ministries and dependent entities:	6.65 %	Local and autonomous administrations and dependent entities:	6.50%	Teaching and research	3.00%	Construction and related industries	34.15%	Practising professionals and Consulting	30.00%	Transport, Communication and new technologies companies	1.80%	Energy, water and environmental companies	2.93%	Real Estate, Finance and Insurance companies	2.65%	Various (apart from 'other industries' this percentage includes retired, jobless, most recently graduated etc.)	2.22%				
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Various (apart from 'other industries' this percentage includes retired, jobless, most recently graduated etc.)	2.22%																						
Turkey	<p>Civil engineering implementation in Turkey covers a very wide range of applications. All areas of civil engineering are intensively realised.</p> <p>The Private sector (approximately 60%), presents a wide range of consultant-contractor-material industry distribution. These sub-areas can be undertaken individually and there can also be joint functions among them by civil engineers. The numerical distribution of the areas is hard to determine, as job descriptions in the private sector are not recorded in the required detail to respond.</p> <p>The number of civil engineers working in the public sector is approximately 40% of the total number of civil engineers. National authorities feature most of the civil engineers in the public sector, rather than local authorities.</p>																						
United Kingdom	<p>The proportion of engineers working in the public sector is quite low. There are no specific statistics available for civil engineers but on the basis of employment of registered engineers (all disciplines) by industrial sector (2002) the following picture emerges:</p> <table data-bbox="459 1585 1005 1953"> <tr> <td>Manufacturing:</td> <td>39.5%</td> </tr> <tr> <td>Utilities:</td> <td>8.9%</td> </tr> <tr> <td>Construction:</td> <td>7.8%</td> </tr> <tr> <td>Wholesale and retail:</td> <td>0.4%</td> </tr> <tr> <td>Transport and communication:</td> <td>6.4%</td> </tr> <tr> <td>Financial and business:</td> <td>19.5%</td> </tr> <tr> <td>Public sector:</td> <td>9.7%</td> </tr> <tr> <td>Education:</td> <td>6.2%</td> </tr> <tr> <td>Agriculture:</td> <td>0.3%</td> </tr> <tr> <td>Mining:</td> <td>0.7%</td> </tr> <tr> <td>Other:</td> <td>0.7%</td> </tr> </table> <p>(Source: Engineering Council UK)</p>	Manufacturing:	39.5%	Utilities:	8.9%	Construction:	7.8%	Wholesale and retail:	0.4%	Transport and communication:	6.4%	Financial and business:	19.5%	Public sector:	9.7%	Education:	6.2%	Agriculture:	0.3%	Mining:	0.7%	Other:	0.7%
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CHAPTER 14

CONTINUING PROFESSIONAL DEVELOPMENT AND LIFELONG LEARNING

The aim of this chapter was to ascertain what obligations exist in each member country (be it by national government, public authority or professional body) to ensure that members remain up-to-date with their technical skills and knowledge. We also enquired what efforts the national association makes and what role it plays in ensuring highest possible standards of continuing professional development for its members.

Two questions were asked of members:

14.1 - *Is continuing professional development (CPD) mandatory in your country following graduation?*

14.2 - *How are you promoting lifelong learning (LLL) amongst your members?*

COUNTRY	
Croatia	<p>Continuing professional development following graduation is voluntary. Some groups of civil engineers are obliged to pass a state examination to become qualified as responsible site managers, Chamber members or public servants.</p> <p>Therefore almost everyone tries to pass this examination after having gained four to five years of professional experience. In the past years lifelong learning has been organised in the scope of societies of civil engineers. Faculty teachers provide their services in specialised educational courses of this kind. These courses/seminars normally last three to five days.</p> <p>The obligation of lifelong learning has recently been introduced in the new Building Law (2003). Forthcoming regulations are expected to further define this obligation, the principal aim being to ensure continuous education of engineers and their prompt acquaintance with new practices and innovations in the field of civil engineering.</p>
Cyprus	<p>Although continuing professional development is not mandatory in Cyprus, a great effort is made by the local Associations, the Technical Chamber and private Consultancies to provide this opportunity to local engineers.</p> <p>Promotion of lifelong learning: Lifelong learning is promoted by organising seminars, lectures, site visits, and short specialised courses.</p>
Czech Republic	<p>Continuing professional development: CPD is compulsory in the Czech Republic.</p> <p>Promotion of lifelong learning: The Czech Chamber currently publishes a guidebook for CPD. This is a guide for all members which is also available on the web.</p>

Estonia	<p>Continuing professional development is mandatory in order to obtain the title of Chartered Engineer or European Engineer. The certificate must be updated every five years.</p> <p>During this period the civil engineer who seeks to obtain a certificate should attend various professional courses and seminars.</p> <p>Promotion of lifelong learning: EEL has a leading role in the process of continuing professional development which involves attendance at a variety of professional courses and seminars.</p>
Finland	<p>No, Continuing professional development is not compulsory but is highly recommended.</p> <p>To promote lifelong learning amongst our members, we offer tailor-made further education and training to our members and influence and encourage companies to allocate money for lifelong learning.</p>
France	<p>Continuing professional development is not mandatory as such, but it is general practice since 1971, when companies were obliged by law to use around 1% of the gross salaries for Continuous Education. (Today, 1.6 % is mandatory, and the law is under revision).</p> <p>The Engineering High Schools ‘Grandes Ecoles’, generally through Engineers Associations, play a major role in Continuous Education (especially the “Ecole Nationale des Ponts et Chaussées” and the “Ecole Spéciale des Travaux Publics”).</p> <p>With regard to this topic, a vote is in progress in Parliament for a new law.</p> <p>Nowadays, new means of continuous education are developed by contractors or design offices, for their own staff (engineers and other professionals), in order to improve the qualifications of the firm’s employees.</p> <p>It deals only a few with technical matters or none at all, the focus is more on other matters which are not always treated sufficiently in establishment of further education (‘Grandes Ecoles’), “Ecole Nationale des Ponts et Chaussées” is managing actions such as “Université Colas”, “GTM Management”, etc.).</p> <p>The “Instituts des Techniques d’Ingénieurs de l’Industrie (ITII)” deliver an Engineer Diploma either to young candidates (26 years old) following a three-year period of training, or to recently employed candidates (three years) engaged in a specific continuous education programme. For Civil Engineering, ITII in Nantes is linked with the Ecole Centrale de Nantes, then delivers the title of “Ingénieur Diplômé de EC Nantes”.</p> <p>Promotion of lifelong learning: CNISF has no specific role in Continuous Education, but Engineers Associations, CNISF members, are particularly active in this matter.</p>
Germany	<p>Continuing professional development is not mandatory but is highly recommended. For specialised civil engineers e.g. Prüfindenieur a number of years of experience combined with CPD is necessary.</p> <p>Promotion of lifelong learning: All chambers, institutions, associations etc organise seminars, congresses and symposiums for their members e.g. UBID, ZBI, VDI, Ingenieur-Kammern (Chambers of Engineers) etc.</p>

<p>Greece</p>	<p>All the Polytechnic Universities offer postgraduate courses for professional engineers in various engineering topics.</p> <p>Both the Technical Chamber and the Association of Civil Engineers organise cycles of continuing professional development, seminars and congresses.</p>
<p>Hungary</p>	<p>Continuing professional development: For the moment, CPD is not mandatory in Hungary.</p> <p>Promotion of lifelong learning: Lifelong learning is promoted by organising professional presentations: Symposiums, publications of proceedings, etc.</p>
<p>Ireland</p>	<p>Continuing professional development: CPD is not mandatory in Ireland.</p> <p>Promotion of lifelong learning: The IEI promotes lifelong learning through a CPD Employers' Scheme as part of its pro-active policy of Continuing Professional Development. The overall IEI CPD Programme has a number of mutually reinforcing elements:</p> <ul style="list-style-type: none"> • CPD Accreditation Scheme for Engineering Employers: a scheme designed to stimulate and recognise good organisational performance in the area of professional development • Training Courses & Seminars designed to meet the needs of engineers in Ireland • CPD Events – Technical Lectures and Seminars run by the IEI's 31 Regions/Divisions/Societies • Register of Training Providers – a one-stop shop for sourcing training of relevance to engineers • Best Practice Sharing – identifying organisations that have good CPD practices in place and that are willing to share such practices with others <p>The IEI's CPD Programme is supported by the Department of Enterprise, Trade & Employment under the National Training Fund.</p>
<p>Italy</p>	<p>Whilst professional updating is not required by law in Italy, the tendency in this direction, as interest in this field, is increasing more and more.</p> <p>It should be noted that CNI has recently asked its Centro Studi to prepare some hypotheses to introduce compulsory CPD for the Members of the Albo.</p> <p>Both, CNI and the Ordini, are very active in offering updating conferences, seminars, lectures, etc.</p>
<p>Latvia</p>	<p>Continuing professional development is not mandatory. However, to obtain the certificate for independent activity, it is necessary for each engineer individually. Certificates must be updated every five years.</p> <p>Promotion of lifelong learning: In 2005 a post-diploma education centre is opened under Faculty of Building and Civil Engineering, RTU. A distance-learning centre (Faculty of Electronics and Telecommunications, RTU) successfully works in the field of lifelong learning and e-learning.</p>

Lithuania	<p>Continuing professional development is mandatory to obtain the certificate for the supervision of design and construction works.</p> <p>Promotion of lifelong learning: Certificates must be updated every five years. During this period the person seeking to obtain a certificate should attend various professional refresher courses. The Lithuanian Association is involved in this process.</p>
Poland	<p>Continuing professional development following graduation is mandatory, but only for members of the Polish Chamber of Civil Engineers in the form of professional experience and practice, attendance at courses, seminars and scientific-technological conferences.</p> <p>Promotion of lifelong learning: Lifelong learning is promoted amongst our members by a 'Promoting system' which includes the possibility of:</p> <p>(1) reaching the succeeding specialisation rank in civil engineering, and</p> <p>(2) leading the independent technical activity.</p>
Portugal	<p>Continuing professional development: In Portugal continuing professional development is not mandatory following graduation.</p> <p>Promotion of lifelong learning: In Portugal we do not promote lifelong learning amongst our members in a consistent way. Universities usually have programmes for continuing education, based on short technical courses. The Ordem (OE) is now promoting the evaluation of post-graduation courses to come up with a credit system for lifelong learning for its members.</p>
Romania	<p>Continuing professional development: There is no mandatory continuing education after graduation. However, a variety of further qualifications following a five-year degree provides specialist or further education.</p> <p>The top 20% of civil engineering graduates from the five-year education programme, may continue a university education in the form of the 'Programme of Advanced Studies'. This programme lasts one year and leads to a 'Diploma of Advanced Studies' in fields such as structures, geotechnical engineering, transportation works, hydro-informatics, etc.</p> <p>Another form of post-graduate education is the Doctorate programme which is also open only to civil engineers who have completed the five-year engineering degree. The normal duration is four years for candidates studying full time or five years for extra-mural activities. The diploma of Advanced Studies is an asset for admission to the Doctoral programme which leads to the scientific degree of Doctor in Engineering after successful publication and defence of the doctoral thesis.</p> <p>Programmes for areas pertaining to structural analysis, fluid mechanics, geotechnical engineering, reinforced concrete structures, steel structure, hydraulic structures, roads and airfields, railways, bridges and tunnels, management and construction engineering, etc. are organised by the Technical University of Civil Engineering of Bucharest and by the Technical Universities in Timisoara, Iasi, and Cluj-Napoca.</p> <p>Promotion of lifelong learning: The same universities and also professional associations mentioned in relation to post-graduate training, organise various forms of continuing education activities such as intensive courses of one day to two weeks, seminars, practical stages etc. for which fees are supported by the companies or by individuals attending.</p>

<p>Russia</p>	<p>Continuing professional development following graduation is both voluntary and mandatory for some groups of civil engineers who are seeking to become qualified as responsible site managers, ROIS members or public employees.</p> <p>Therefore, almost everyone tries to pass certification of professional experience each five years. In the past years lifelong learning has been organised in Universities, special institutions and in the scope of ROIS. Specialised educational / training courses are of different terms, starting from 72 to 500 and more teaching hours.</p> <p>Promotion of lifelong learning</p> <p>Russian Society of Civil Engineering makes enormous efforts to make CPD and lifelong learning mandatory in civil engineering.</p>
<p>Slovak Republic</p>	<p>Continuing professional development</p> <p>Continuing professional development is not mandatory in general, but authorised civil engineers have to prove their qualifications and continuous professional growth by active participation in training, seminars and by other professional activities. This is approved by the Slovak Chamber of Civil Engineers and by the law.</p> <p>Promotion of lifelong learning</p> <p>All chambers, professional institutions, universities, associations and other educational institutions are performing lifelong learning in accordance with the lifelong learning programmes. The Faculty of Civil Engineering at the Slovak University of Technology in Bratislava has developed such a programme for civil engineering graduates.</p>
<p>Slovenia</p>	<p>Continuing professional development</p> <p>Continuing professional development following graduation is voluntary. Some groups of civil engineers are obliged to pass examination to become qualified as responsible designers, site engineers, supervisors or public servants.</p> <p>Promotion of lifelong learning</p> <p>The Academy of IZS organises special courses and seminars for members on a voluntary basis. Some other examples of the Chamber's continuing professional development activities are organising and supporting congresses, symposiums and meetings.</p>
<p>Spain</p>	<p>Continuing professional development</p> <p>Currently, CPD is not mandatory in Spain, however, it is considered an ethical requirement. Civil engineers employed by the Public Administration, however, need to accumulate certain credits in order to promote further in their career.</p> <p>Promotion of lifelong learning</p> <p>The Colegio organises conferences, courses etc. all over Spain on an ongoing basis.</p>
<p>Turkey</p>	<p>Continuing professional development</p> <p>There are no obligations for professional development in Turkey for civil engineers after they obtain their university degree. Lifelong learning is completely discretionary.</p>

<p>./.. Turkey</p>	<p>Promotion of lifelong learning</p> <p>The Turkish Chamber of Civil Engineers aims to provide countrywide professional development programmes for colleagues, with the perspective of having the responsibility to maintain a lifelong learning system. The branches of the Chamber organise individual educational courses and offer training for civil engineers in the regions.</p> <p>Also, TCCE organises general special programmes, applied in specific branches and representative offices. The sustainability of these programmes is one of the most important aims and activities of TCCE.</p> <p>Some examples of our Chamber's continuing professional development activities are:</p> <p>I.a. Congresses: Annual or longer periodic congresses are held by the Chamber on general, specific, divisional; and specialist subjects. These have become traditions of the Turkish civil engineering sector.</p> <p>I.b. Symposiums: Symposiums on general or specific subjects are being held by the Chamber as one body or as branch activities.</p> <p>I.c Seminars: Seminars are held more often in regard to congresses and symposiums. They cover subjects deemed essential at the time, or the lack of usage and applications in some areas.</p> <p>II. Regular Courses: Our branches hold regular courses for both students and graduate civil engineers. These can be arranged in any specified topic, according to need and demand. Regular courses last 50-60 hours, over a total period of two to three months.</p> <p>III. Brief Courses</p> <p>These are held as discrete short-term activities on subject basis, such as earthquake, rehabilitation; and reinforcement, etc.</p>
<p>United Kingdom</p>	<p>Continuing professional development</p> <p>Continuing professional development is not mandatory in the U.K. However, for ICE members the requirement to maintain CPD and CPD records is obligatory.</p> <p>Formal checking of people's CPD record takes place when a member applies for a change in membership grade.</p> <p>Promotion of lifelong learning</p> <p>To promote lifelong learning amongst members, the ICE currently publishes a guidebook called 'Continuing Professional Development – a guide for all members' which is also available on the ICE web-site. Graduates under structured training are required to record their CPD and submit it for review.</p> <p>CPD is promoted in a variety of seminars and presentations and the ICE is currently looking at more effective ways to promote the culture of lifelong learning in partnership with its commercial arm – Thomas Telford (book publishers, training providers, recruitment consultants).</p>

CHAPTER 15

PROMOTION OF THE PROFESSION

Respondents were asked to complete a table of services offered to members and to provide information on the following activities that promote the profession:

1. - *Publications by member organisations of ECCE*
2. - *Engineering weeks/days celebrated in member countries*
3. - *Activities to make civil engineering studies more attractive to all*

COUNTRY	
Croatia	<p>To attract prospective students, all universities organise an annual event called "Open university days" which takes place in April each year. At this event, prospective students are informed in more details about the studies, programmes, laboratory facilities, employment possibilities, and are given appropriate promotional material.</p> <p>The Croatian Academy of Engineering makes continuous efforts to promote technical sciences and to enhance their role in society. Activities undertaken in this respect include workshops, seminars, conferences and participation in public discussions, all in order to stress the significance of technical sciences in the society, particularly in the light of rapid developments in information science. Promotional "Days of Technical Engineering" are also planned.</p> <p>The Croatian Academy of Sciences and Arts bestows awards for exemplary achievements in technical sciences (annual awards and lifetime awards).</p> <p>The technical Museum in Zagreb hosts permanent thematic exhibitions showing development of technical sciences.</p> <p>Every spring, the Construction Industry Fair is organised at the Zagreb Fair. Some minor construction exhibitions are held in other towns as well.</p> <p>The following professional journals covering the field of civil engineering are published on the regular basis: <i>Građevinar</i> (Civil Engineer), <i>Graditelj</i> (Construction Engineer), <i>Tehnički vjesnik</i> (Technical Bulletin), <i>G021</i> (Civil Engineering and Equipment), <i>Ceste i mostovi</i> (Roads and Bridges), <i>International Journal of Engineering Modelling</i> (in Split), <i>Hrvatske vode</i> (Croatian Waters).</p>
Cyprus	<p>The two local Civil Engineers' Associations and the Cyprus Technical Chamber publish their own technical magazines. The magazines are usually issued quarterly.</p> <p>The two local Associations participate in a 'fair' organised by the Ministry of Education for career guidance to students and to help them decide on the career they would like to follow. Representatives of the Associations explain to the students the profession of the civil engineer in a simple and convincing manner.</p>
Czech Republic	<p>An Engineering Day is held yearly.</p>

Estonia	EEL is involved in the preparation of drafts of laws and Government Acts, or curricula and Guidelines for University education studies.
Finland	<p>The image of the civil engineering profession declined in Finland in the early 1990's, mainly due to a heavy recession in the industry. However, there has been a clear improvement since the mid-90's and the status is now fairly good. Nevertheless, there is still much to be done to increase the interest among the youth to attract talented young people to the profession to compensate for the huge amount of senior engineers who will retire in the coming ten years. Also the salaries in certain areas of civil engineering are still quite low which means that need for status improvement is required. The building industry is unfortunately presented in the daily news mainly in negative matters, e.g. in reports on dampness problems, structural failures, and the 'grey economy'.</p> <p>Skill shortage in certain civil engineering professions is becoming a really serious problem, especially among designers (mostly structural designers). The main reason is that during the 90's recession the design fees drastically fell and have not yet fully recovered. As the fees were smaller, the design engineer had not the same possibilities for input in the projects and, therefore, the designers' status was diminished. The result is that today the designers are overworked with poor pay and low status. The reputation of the design work has also reached students, resulting in few students in structural design.</p> <p>Skill shortage will be more evident also in other areas as the "baby boomers" will be retiring in the coming years. Over the next few years newly graduated engineers possessing a masters degree will equate to approximately 70 % of the number of retired engineers. This will lead to a shortage and problems. The work will, therefore, be done by less skilled personnel. However, many construction companies have already noticed this problem and employ students for summer jobs, etc., thus providing them with a career within the company at an early stage.</p> <p>The construction industry is not seen as very attractive among talented youth. The schools do not give a clear picture of civil engineering. The industry has had activities directed at young people to encourage them into careers in different types of construction professions. The marketing of civil engineering as the caretaker and improver of our physical environment has produced quite good results. The approach to combine environmental and civil engineering has been successful in especially awakening interest among girls. Also, the status of skilled workers is growing, as the lack of skilled people is becoming more evident. This also gives a better image for the whole industry as a career opportunity.</p> <p>Applications to masters degree courses is growing again after many difficult years in the 90's. In Helsinki University of Technology the total amount of direct applications to the civil engineering courses was 9.2 % of all applications in 2004, the best result since 1987. The worst year was 1998, when only 3.5 % of the applicants selected civil engineering as their first alternative. So, a clear improvement has happened. Also the same trend can be seen in bachelor degree courses in other universities. The industry has an important role in taking care of the students and retaining their interest (e.g. providing summer jobs, lecturers, interesting projects). Of course, computer science, bio-engineering and other "hot" courses are still very popular, but civil engineering has managed to gain back some lost ground.</p> <p>Examples of activities to promote the civil engineering profession:</p> <p>* A group of associations within the civil engineering industry (including RIL)</p>

<p>./.. Finland</p>	<p>has combined forces to activate an campaign directed at young people (age 10-18) to increase their interest in civil engineering. The main idea is to ensure a uniform strategy and media policy (everybody talks the same way) and carry out projects that explains the content of civil engineering and gives it a better image. Keywords are the national importance of the industry (economic and environmental aspect), the diversity (international and different careers with high opportunities) and a “feeling of positive activity” (spectacular projects, ITC widely applied, human co-operation, etc). The projects are different activities (e.g. at fairs and schools), providing “educational” material for young people with civil engineering content (data programmes, books, TV-programmes, competitions, education material for schools, etc.) and different media efforts (websites, magazine for schools, reports in papers and magazines, after-school clubs for children, etc.).</p> <p>* The decline of the status of the design profession is targeted in a special RIL-project (2003-2004). The aims of the project are to provide the clients and project managers with relevant data on the importance of the design phase and, together with other interested associations, create bidding models to ensure that the design fee is reasonable. Also media attention on the problem is activated by the project.</p> <p>* Overall, a close co-operation between different associations and parties within the industry is required to correct the status and the image of the industry. The best way to ensure that talented people are attracted to the industry (= the status is high) is by developing the industry itself (better product quality and processes), by giving more positive media output of the industry and take a stronger responsibility in environmental issues (= develop sustainable construction).</p> <p>* The civil engineering departments in universities have had difficulties in funding education and research. The industry should work for increased governmental funding or itself contribute in raising the quality of the education (better material, equipment, new teaching methods, etc). Also the possibilities for post-graduate studies should be made easier.</p> <p>* Persons with a civil engineering background should be encouraged to participate in local and national politics and thus also create a positive image of the profession.</p> <p>*A “Civil Engineers Day” is arranged every year by RIL, in 2004 this was done also in co-operation with architects.</p>
<p>France</p>	<p>To-day, there is no lack of civil engineers in France, but big efforts are developed in order to always ensure numerous and excellent candidates.</p> <p>CNISF is active in a number of ways in order to promote the engineering professions.</p> <p>- in guidance for young students (Classes in “Lycées”), in order to help them to choose studies allowing them access to engineering careers. The plan “Action 2000, Ingénieur demain” (<i>Action 2000, Engineer tomorrow</i>) brings together the ‘Grandes Ecoles’ (<i>High-level educational institutions</i>), Universities and professionals in order to hold a forum (contacts with students, parents, teachers), specific presentations, seminars: in year 2002/2003, 210 actions were organised in France.</p> <p>- Le “Salon des Ingénieurs” (<i>Engineers’ Show</i>) is organised every year in order to allow contacts between companies and engineers seeking a first or a new job. Several thousands of engineers visit the exhibition stands during the two days of the show.</p>

<p>./.. France</p>	<p>- The CNISF Socio-Economical Survey. This biennial survey aims to establish knowledge regarding the social and economical environment of the engineering profession: it deals with education, salaries, career development, sectional activities, responsibilities involved, changes in employment, etc. The 15th Survey dealing with the year 2002, was issued in September 2003.</p> <p>The yearly “Chéreau-Lavet Award” (www.lavet.org) is open to engineers having developed major innovation already implemented in production: the 2003 Award, for instance, was attributed to the engineer who invented the “Self-cleaning glass” used in the building industry.</p> <p>Professional Federations are also developing very important actions for promotion of the Civil Engineering Profession.</p> <p>- Fédération Nationale des Travaux Publics (FNTP) et Fédération Française du Bâtiment (FFB), as well as other Professional Federations have very important programmes that promote civil engineering.</p> <p>For example, at regional level, FNTP (in partnership with other professionals and Local Authorities) carries out around 100 actions a year. They involve young students from “Lycées” (<i>secondary schools</i>), Professors, Directors and Education System Inspectors, unemployed persons, etc. Actions deal with visits to jobsites, presentations, professional exhibitions, etc.</p> <p>- The main contractors and professional federations are members of many Councils of Civil Engineering “<i>Grandes Ecoles</i>”</p> <p>Professional Federations offer Grants, as scholarships for Students.</p>
<p>Germany</p>	<p>Nearly all German (civil) engineering associations undertake a number of specific actions to support the profession by organising congresses, meetings with the public, awarding ceremonies for young civil engineers with respect to their diploma works, possibilities for young absolvents to participate in podium discussions, organising workshops for differently specialised civils etc.</p> <p>Because of the high number of general and specific civil engineering associations and industry groups a lot of such events take place during each year. The target groups are both the young and the adult and senior civil engineers as well as the whole public. Especially, female students and absolvents are highly supported to build up own (female) civil engineering networks. The starting point for this latter activities are very often the universities and their alumni organisations.</p> <p>All (civil) engineering associations and industrial groups do envisage a coming lack of professional civil engineers even if the actual situation on the building market seems to show not such a shortage. Therefore, the activities to recruit civil engineering students is still high. All bigger associations have their main office in Berlin – and quite a lot of them also in Brussels – to do lobbying work there in a rather big amount. But all of them also have activities in primary and secondary schools.</p> <p>The most important associations in this respect and their activities may be found under their names in the respective web-pages (VDI, BingK, Bauindustrieverband, ZDI, UBI-D etc.)</p>
<p>Greece</p>	<p>The Technical Chamber issues a weekly magazine and has a web site with useful information on engineering matters.</p> <p>The Association of Civil Engineers issues a monthly bulletin and organises scientific seminars and meetings frequently.</p>

<p>Hungary</p>	<p>The Hungarian Chamber of Engineers issues “Mérnökújság” (News of Engineers) every month. It is distributed among members free of additional charge. There are several type of professional papers in each sector of the engineering activities (e.g. Static, Soil mechanics, Foundations, etc.).</p> <p>The Hungarian Chamber of Engineers founded several awards for engineers, and together with the U.K. Institution of Civil Engineers (Midlands branch) presents the ‘Tierney Clark Award’ to a project.</p> <p>There is no special Engineers’ Day, but there is a “Construction Industry Day” in early June.</p>
<p>Ireland</p>	<p>A number of initiatives are undertaken to encourage student members. Students who have successfully completed the first year of an IEI accredited Certificate/Diploma or Degree are eligible to apply for free student membership. Other benefits include access to a free online CV register.</p> <p>In November 2000, the Minister for Education and Science launched the programme “STEPS” - Engineering as a Career. STEPS is the Science, Technology and Engineering Programme for Schools which is organised in partnership between the Institution of Engineers of Ireland, the Department of Education and Science, Forfás, Fás and a number of leading high technology industries. The programme aims to address the problem of shortage of engineers by increasing public awareness, making career information available, developing projects to encourage students to undertake related subjects at schools and colleges and promote the take-up of science, technology and engineering subjects among girls. At present the ratio of graduates in engineering overall is around 83.5% male and 16.5% female.</p> <p>In 2004, 3,450 primary school pupils from 115 primary schools in Ireland participated in the Junior Engineer for Ireland K’nex Challenge working in teams of two to design and make a model with K’nex construction kits⁶. Winning teams progress from school to regional to national level. The winning school in the national final represents Ireland at the Celebration of Engineering in London organised by Young Engineers.</p> <p>Seminars are organised for guidance counsellors, course co-ordinators, science, engineering, technology and other interested teachers regarding engineering as a career. A database is maintained of industry personnel who are willing to assist schools at school careers days, open days, parents nights, talks, etc. Classroom resource materials are also available for teachers and students.</p> <p>Information is available through a variety of specialist web-sites such as: www.steps.ie for the STEPS programme, www.witsireland.com details programme run by Women in Technology and Science (WITS) and www.mentrolink.com which investigates gender issues associated with engineering.</p>
<p>Italy</p>	<p>C.N.I. publishes and circulates a monthly magazine of information and culture L'Ingegnere italiano, freely sent to all the Members of the Ordine.</p> <p>To contribute to enhance the Engineering profession, CNI has created a Centro Studi in 1999 which has already published about 60 books relevant to the profession on issues relevant to the profession.</p>

⁶ These are construction kits designed for children aged from 3 upwards to teenagers – in other words from entry level to advanced kits with thousands of pieces. (www.knex.com)

./. Italy	Finally, CNI has created the internet site www.tuttoingegnere.it to promote the profession in Italy. This site deals with four main aspects: employment (a data bank with the engineers' curricula vitae and the job offers by companies), vocational training (a guide to training and to updating courses run by universities and by the Provincial Ordine), regulations (national, regional and European legislation, in force relevant to the profession) and tenders (in Italy and in the other EU countries).
Latvia	-
Lithuania	-
Poland	<p>With regard to publications by member organisations of ECCE, the Polish Chamber produces:</p> <p><i>Engineering and Building – monthly review</i></p> <p><i>Building Review - monthly review</i></p> <p><i>Proceedings of National and International Conferences in the range of civil engineering</i></p> <p>Our publications are in printed form and also in electronic form on a web-site: http://www.zgpzibt.org.pl</p> <p>Polish Chamber of Civil Engineers has its own web-site: http://www.piiib.org.pl</p> <p>In Poland the following Engineering Days are celebrated:</p> <p><i>Building Day, Hydro-technicians Day</i></p> <p>A number of activities are undertaken to make civil engineering studies more attractive to all.</p> <p>Attractive practices in-country and abroad, technical visits and excursions, individual course of study, membership in scientific-technological Circles of Students, attendance in professional practice under supervision of an academic teacher who is also a civil engineer specialist.</p>
Portugal	<p>The Ordem dos Engenheiros promotes the following activities for Civil Engineers:</p> <ul style="list-style-type: none"> - <i>A periodical Journal for OE;</i> - <i>A yearly national congress for all the engineers;</i> - <i>A yearly national meeting for civil engineers;</i> - <i>Periodical technical sessions on relevant subjects for civil engineers;</i> - <i>Participation in almost all national technical meetings for civil engineers;</i> - <i>Organisation of the Engineers' Day;</i> - <i>Visits to main construction sites;</i> - <i>Organisation of a prize for the Best Young Engineer;</i> - <i>Acceptance of student members, receiving all the OE information.</i>
Romania	There are a few publications edited by the members of the Union of the Associations of Civil Engineers (i.e. Romanian Journal of Materials).

<p>Russia</p>	<p>Publications by member organisations of ECCE</p> <p>There are a number of professional newspapers (for example, “Construction Newspaper”), and journals in civil engineering and related problems, issued in Russia, for example, “Industrial and Civil Engineering”, “Earthquake-resistant Construction”, “Concrete and Reinforced Concrete”, “Hydrotechnical Construction”, “Engineering Geology and Geoecology”, “Building Materials and Structures of XXI Century” and others.</p> <p>Engineering weeks/days celebrated in member countries</p> <p>The “Constructor Day” - a professional day of civil engineering is celebrated annually on the second Sunday of August.</p> <p>Activities to make civil engineering studies more attractive to all</p> <p>To attract prospective students, all civil engineering universities annually organise a chain of events (starting from February to May), called "Open university days" which take place once a month. At these events prospective students are informed in more details about the studies, programmes, laboratory facilities, employment possibilities, and are given appropriate promotional material.</p> <p>The Russian Academy of Architecture and Construction Sciences with ROIS and other professional associations make continuous efforts to promote civil engineering sciences and to enhance their role in society.</p> <p>Activities undertaken in this respect include workshops, seminars, conferences and participation in public discussions, all in order to stress the significance of civil engineering sciences in society, particularly in the light of rapid developments in information science.</p> <p>The Polytechnical Museum in Moscow hosts permanent thematic exhibitions demonstrating the development of technical sciences.</p> <p>There are a lot of Construction Industry Fairs, organised in various regions of Russia at local and state level, as well as organised by overseas construction companies.</p>
<p>Slovak Republic</p>	<p>1. Publications by member organisations of ECCE</p> <p>The Slovak Chamber of Civil Engineers publishes the newsletter “Inžinierske informácie” (<i>Engineering Information</i>). This bulletin informs the members on matters within the chamber, such as the minutes from the meeting of the Executive Board of the Chamber; reports on the activities of the chamber committees and working groups; Slovak and European legislation regarding the civil engineering profession, the organised conferences, new publications in the civil engineering sector, news on the international field of civil engineering, etc.</p> <p>The Chamber also publishes the magazine “Projekt – stavba” (<i>Project - Construction</i>) and other publications and manuals.</p> <p>Moreover, other magazines regarding the field of civil engineering are published in Slovakia, e.g. “Slovenské stavebníctvo” (<i>Slovak Construction Sector</i>), “Eurostav”, “Stavebný podnikateľ” (<i>Construction Entrepreneur</i>), and so on.</p> <p>2. Engineers’ Days</p> <p>Civil Engineers' Day is celebrated on 24th June in Slovakia.</p>

<p>./. Slovak Republic</p>	<p>3. Activities to make civil engineering studies more attractive to all</p> <p>Students studying civil engineering in Slovakia have the possibility to become a member of the Chamber in order to obtain more information and knowledge in this sector. Furthermore, the Award of the President of the Slovak Chamber of Civil Engineers is given every year to the students with the best master thesis.</p> <p>The Slovak Chamber of Civil Engineers also provides its members with the possibility of lifelong education.</p> <p>Slovak graduates in civil engineering have also the opportunity to win the EUR ING title and registration in the register of the European Federation of National Engineering Associations [FEANI]. This title confirms that its bearer is the graduate of a Technical University, has the title "Engineer", has an adequate professional practice and is speaking one of the acquired foreign languages. The awarded certificate EUR ING is valid in all FEANI member countries.</p>
<p>Slovenia</p>	<p>The Universities organise an annual event each Spring called "Open University Day" for prospective students. This event provides more detail about studies, programmes, employment possibilities, etc., in civil engineering.</p> <ul style="list-style-type: none"> - IZS organises an "Engineering Day" once each year as a Fair for the Engineering Profession in Slovenia. - IZS – MSG presents awards once a year for exemplary achievements in technical sciences (annual awards and lifetime awards). - In Spring time the Construction Industry Fair is organised in Gornja Radgona where domestic and foreign industry demonstrates the latest achievements in civil engineering. - Professional journals cover the field of civil engineering: "Gradbeni vestnik" ("<i>Civil Engineering Bulletin</i>"), "Gradbenik" ("<i>Civil Engineer</i>"), "Velike pregrade" ("<i>Large dams</i>"), "Novo v IZS" ("<i>New in Engineering Chamber of Slovenia</i>"), different Proceedings of National and International Conferences from the field of civil engineering organised in Slovenia.
<p>Spain</p>	<p>The Colegio publishes the following:</p> <p>'La Voz del Colegiado/Buletín de Información', this bulletin is only sent out to members of the Colegio. It is published on a monthly basis and keeps members informed about both social and professional events that have already taken place (decisions taken by the Board of Directors, permanent Working Groups, etc.) or events that are due to take place in the various territories all over Spain.</p> <p>The Colegio publishes a technical magazine "Revista de Obras Públicas", founded in 1853. It is published on a monthly basis and sold by subscription; it reaches a large number of professionals in various fields in Spain, due to the very high quality content. Furthermore, the Colegio issues "CAUCE" on a bi-monthly basis and four times a year the "OP Ingeniería y Territorio" magazine.</p> <p>The Colegio also publishes various technical and non-technical editions to be sold through the library both at the Colegio's head office in Madrid as well as through the library service at the Escuelas.</p> <p>Through the permanent Committees of the Colegio, civil engineers participate in the discussions of interest for their professional career within any of the many fields of engineering.</p> <p>Annual awards are given to outstanding professional civil engineers; large exhibitions are organised on civil engineering; civil engineering students are invited to join the Colegio in their last year of study .</p>

<p>Turkey</p>	<p>1. TCCE has many organisations and publications. Main activities are as follows:</p> <p>Turkish Engineering News is published in six issues a year, 15,000 copies since 1955, including social and technical related special cases. It had published its 423rd issue by July 2003.</p> <p>Technical Digest has been published since 1990, four issues a year. It contains technical and scientific articles that had been evaluated by a board of judges. At the end of each year, English-language summaries of articles are gathered in a Digest and published as a compilation of the year. The Technical Digest is cited by five international indexes; Engineering Index, Concrete Abstracts, National Technical Information Service, CITIS, Ulrich's International Periodicals Directory. The main target of forthcoming issues is to maintain the citation by Science Citation Index.</p> <p>The Technical Congress and Exhibition has become a bi-annual civil engineering tradition in Turkey since 1962. It is the widest and most important organisation of civil engineering profession in the country. Research and presentation of recent developments in theoretical studies and applications in the civil engineering field and holding discussions about the implementation of these advances in Turkish civil engineering areas form the basis of the Congress. It is important to provide an exchange of information between colleagues, academic society, and students. The Technical Congress has started to widen its range in international relations recently, and this was a very important part of the content of the 17th Congress held in April 2004.</p> <p>Other Congresses on specific areas are realised annually or in longer periods, such as National Conference of Earthquake Engineering, National Concrete Congress, Transportation Conferences, Water Resources Conferences, Coastal Engineering Symposium, Steel Structures Symposium, Bridge Symposium, Civil Engineering Information Technology Implementations Symposium, Structure Strengthening Symposium, Traffic Engineering Symposium, Geotechnics Symposium, Structural Management Symposium, Urban Infrastructure Symposium, etc.</p> <p>2. Since the foundation of TCCE on 19th December 1954, the week of foundation has been celebrated as "Civil Engineering Week". According to the graduation years, colleagues have been honoured by ceremonies to celebrate their "40th" resp. "25th year in the profession". In 2004, TCCE celebrated its 50th anniversary, and held its "50th Year Civil Engineering General Assembly".</p> <p>3. In order to encourage student involvement in activities, relationships with civil engineering departments are kept intensively dynamic, and publications, events and related issues are announced. The General Student Assembly organisation of our Chamber is the most important part of our approach to student-colleague relationships and our will to provide a vision for the students.</p> <p>TCCE also participates in social aspects as well as technical aspects, such as those realised in Hasankeyf. Ilisu Dam is planned to be constructed above the stream line of the river passing through the ancient village of Hasankeyf, one of the amazing sights of Turkey: soon after construction is completed the village will be submerged under dam water. TCCE was in the ceremonies in June 2003, which were held for five years to oppose dam construction.</p> <p>The publications, congresses, seminars, 40th and 25th year ceremonies, and student assemblies are all included in the desire of our Chamber to promote and encourage the sector.</p>
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<p>United Kingdom</p>	<p>ICE is actively promoting the civil engineering profession in a number of ways. ICE contributes to the development of public policy at all levels of government in areas concerning UK's infrastructure and quality of life. A main tool in attracting the interest of Government and Parliament is the yearly "State of the Nation" report, which assesses the state of UK infrastructure. There is a yearly launch in the Houses of Parliament in London, attended by government ministers, MPs and ICE members. This normally attracts coverage by major television channels and national newspapers. Supplementary regional versions of the State of the Nation report are also made.</p> <p>ICE also contributes to the political debate by giving expert evidence to Parliamentary Select Committees and submitting written evidence to Parliamentary inquiries and responses to Government consultations.</p> <p>In connection with general, regional and local elections in the UK, ICE makes a statement, an "Agenda for Change", of what it would like to be happen in areas such as transport, energy, environment etc. ICE does not take a view on the political parties' programmes, but points to improvements that could be made in these areas. ICE has the advantage of being an independent, non-political and non-commercial organisation which can give an authoritative voice on major social and political issues.</p> <p>ICE engages with schools and university in order to create interest for engineering amongst children and teenagers, encouraging more young people to choose civil engineering as a career. Information material is targeted at different age groups, from seven-year old children to undergraduates.</p>
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CHAPTER 16

CHANGING WORKING PRACTICES

The responses in this chapter may be considered to be more 'subjective' than 'objective'. The questions themselves reflect queries or areas of concern expressed by members over the period in which the questionnaire was being developed.

The answers that members have given reflect their perception of such issues and are not, on the whole, based on statistical or official information, unless clearly stated within the text.

16.1 - What is your opinion of Eurocodes and how do you believe they will affect the construction sector in your country? In particular, what do accession states feel about harmonisation of codes?

16.2 - How are Environmental Impact Assessments handled in your country?

16.3 - Do you believe that enough is being done to implement Information and Communications Technology (ICT) in your country? Is the use of ICT increasing?

COUNTRY	
Croatia	<p>Eurocodes</p> <p>It is expected that the system of Eurocodes will be introduced officially in design practice by the end of the year 2004 in its ENV version. Eurocodes will replace old national regulations relating to structural design. National Application Documents have been prepared and Croatian translations are completed for ENV 1991, ENV 1992 and ENV 1998. Eurocodes (ENV version) have been taught at all four universities over the last ten years so that many generations of young engineers have become familiar with Eurocodes, and are using these methods in their design work. Introduction of Eurocodes will enhance understanding among designers from all European countries. The acceptance of Eurocodes is considered a big step forward since Croatian design regulations are currently quite obsolete.</p> <p>The construction product directive (Directive 89/106/EEC) is currently being implemented. It is expected that the construction product industry will be obliged to change dramatically its approach to the process of checking conformity of construction products.</p> <p>Environmental impact assessments</p> <p>This field is regulated by a series of laws and regulations on the protection of air, water and soil. In its "Strategy for the 21st Century" the Croatian government specifies extensive measures aimed at improving the present situation in the field of waste management, water management, air quality, noise protection, etc. Feasibility studies covering environmental protection must be produced prior to realisation of every large industrial and infrastructure project.</p> <p>Use of information technology</p> <p>The ICT implementation is gaining momentum in Croatia. The PC technology is dominant in the design process. Computer software programmes accepted on an international scale are widely used in Croatia. On construction sites, information technology is not used to its full capacity. Often it is used only to</p>

<p>./.. Croatia</p>	<p>perform tasks of minor significance (worker registration, calculation of salaries, warehouse item listing, book-keeping, etc.). No information is available that would point to extensive use of ICT in the construction process.</p> <p>Computer technology is used for traffic control on new highways and tunnels. Croatian Railways are developing their own ICT software for passenger services, traffic control, and maintenance activities.</p> <p>In addition, personal computers are used in every engineering office, and Internet is recognised as a common source of information.</p>
<p>Cyprus</p>	<p>Eurocodes are well prepared and will bring the European engineers to work on the “same platform” We believe the effect on the construction sector in Cyprus will eventually be positive, since, until recently design work was carried out using different codes and standards, generally according to the education background of the design engineer.</p> <p>There is a joint committee for each environmental impact assessment study and makes recommendations to the government environmental services how to handle each case. Several government departments and non–government organisations are members of this joint committee.</p> <p>A lot is being done to promote information and communication technology (ICT) in Cyprus and the use of ICT is increasing.</p> <p>ICT is widely used in civil engineering design and construction in Cyprus. Computer software programmes are used in structural analysis, soil mechanics, hydraulics and hydrology, highway engineering, topography, preparation of drawings (CAD) etc. Software programmes are also used in construction for programming and follow the progress of the works, preparation of payment certificates and measurement of the works. Specially tailored software using the SCADA system is used to remotely operate and supervise waterworks and water supply systems and collect and store useful data.</p>
<p>Czech Republic</p>	<p>Eurocodes We hold a positive opinion of Eurocodes.</p> <p>Environmental impact assessments This is dealt with by the Czech Environment Protection law and by EU Directives as well.</p> <p>Use of information technology in the sector There is an effort being made to increase use of ICT, but this is not enough to catch the older generations. Generally, use of IT is increasing.</p>
<p>Estonia</p>	<p>Eurocodes The Estonian Standardisation Centre is the main body for implementation of Eurocodes and EN. Members of EEL participate in this work as members of technical committees.</p> <p>Environmental impact assessments The implementation of legislative documents and environmental policy of the EU is under the responsibility of the Ministry of Economy and Communication and the Ministry of the Environment.</p> <p>Use of information technology in the sector The use of ICT is increasing very significantly.</p>

<p>Finland</p>	<p>Eurocodes</p> <p>The Eurocodes are gradually being adopted. The design codes are usually more complicated and theoretical than what the designers are used to. The important issues are easily overshadowed by a lot of details, which confuses the design engineers.</p> <p>However, the purpose is very good and will bring the European construction sector closer. Training and development of the codes are of course the ways to make things work better. For young engineers there are fewer difficulties in adopting them.</p> <p>Environmental impact assessments</p> <p>The authorities have taken the environmental aspect of civil and building engineering very seriously. Laws, regulations and technology to minimise the environmental burden are developing and in use, which covers a wide scale of environmental issues (energy and material usage, effective lifetime and ecological quality of buildings and constructions, soil usage, recycling and waste minimising, etc.). The methods and technology for environmental effectiveness in civil engineering are in principle already widely available, but as a whole implementation is still at an early stage.</p> <p>Use of information technology in the sector</p> <p>Use of ICT is increasing. A construction of ICT-professorship is under way in Tampere University of Technology at the Department of Civil Engineering.</p> <p>This faculty will start producing MSc level engineers specialised in ICT in the construction sector.</p> <p>Large research programmes (VERA, SARA) have been conducted especially focused on ICT in construction. ICT is an integral part of all new R&D programmes and the Union of Construction Industry has started a very big "Pro-IT"-product model development scheme within the industry.</p>
<p>France</p>	<p>Eurocodes</p> <p>The Eurocodes System will be implemented in the near future (End of "EN" status in 2005). It is considered that Eurocodes are a complex matter which require a strong professional involvement in the short term. As examples, continuous education sessions on this topic are already carried out, and teaching of Eurocodes is already introduced in some establishments (ENPC and Ecole Centrale de Nantes for example), or are ready to be introduced very soon (ESTP for example).</p> <p>Standards for Construction Products, in relation with the related European Directive, are more popular, because of the strong involvement of professionals in preparation of such Standards.</p> <p>Environmental impact assessments</p> <p>Impact assessment studies are current practice because they are now legally mandatory. Some practical documents must be mentioned:</p> <ul style="list-style-type: none"> • Decree on Involvement of Environment and Landscape in Roads Projects (Ministry of Equipment, Land Management, March 1996) • Guide of good environmental Practice (FNTP, Ministry of Land Planning and Environment, Association of French City Mayors) • 21 Commitments for Sustainable Development in the Highways Sector (Association of French Motorways Companies- AFSA) • The HQE (High Quality Environment) Commitments for Buildings.

<p>./. France</p>	<p>Use of information and communications technologies (ICT)</p> <p>ICT is developing continuously out of standard office software and electronic transfer of messages and files. Surveyors are currently using sophisticated GPS reference systems, robotics, localisation systems, and informatics treatment of data are now being used on equipment on sites for roadworks. More sophisticated systems are only at the research stage in terms of numerical modelling of buildings and numerical management of roadwork sites.</p>
<p>Germany</p>	<p>Eurocodes</p> <p>are the normal working tools of a civil engineer, but they do not replace the German standards DIN. Eurocodes are taught in all civil engineering classes at the institutions of higher education.</p> <p>Even if the Eurocodes are treated to be rather “difficult” to understand and applied, the practising civil engineer must also undertake special professional development courses.</p> <p>Concerning the accession states there is no difficulty of application because the education is very scientifically-based and the duration normally is not less than five years.</p> <p>Environmental impact assessments</p> <p>The regulations to implement environmental requirements are very strict. Even for private dwellings there are regulations for minimizing the heat consumption, for using natural or at least ecological building materials. The installation of renewable energy producing systems (water, electricity) is highly supported.</p> <p>Bigger private and public buildings have to be planned and built using methods and technology for environmental effectiveness in civil engineering. Laws, regulations and technology to minimise the environmental burden are developed and - in most cases - in use, which covers nearly the whole scale of environmental issues (energy and material usage, effective lifetime and ecological quality of buildings and constructions, soil usage, recycling and waste minimising, etc.).</p> <p>Implementation of information and communications technology (ICT)</p> <p>The use of ICT is an integral part of both educating civil engineers and using it in the building industry. But as there are different ways of understanding ICT, the variety of use is quite substantial.</p> <p>At universities ICT is normally understood and taught in this way as a construction tool (CAD, Statics Software, Finite Elements Software). But more and more complex software tools are taught concerning planning, supervision, financial development, development in time, etc.</p> <p>All these tools are frequently used in companies. But the use of ICT for general and detailed information exchange is still “a little behind” the possibilities available. Each company has its own self-produced tool.</p> <p>Electronic tendering is used more and more, data banks are offered. It is especially necessary for so called ARGEs (a group of co-operating companies on a temporary basis and on a special project). In some Bundesländer a special software is used which has to be used, too, by the tendering companies. Electronic tendering is not obligatory.</p>
<p>Greece</p>	<p>-</p>

<p>Hungary</p>	<p>Eurocodes have been taught in the University and by the Chamber for several years now. The accession of elder engineers is very slow.</p> <p>Environmental impact assessments are present in Hungary and are handled in the thinking and practice of engineers. There is a Ministry for Environmental Matters in Hungary. Regulations are at EU level. Measures are restricted by financial possibilities.</p> <p>Use of information and communications technologies (ICT) Efforts have been made to encourage the use of ICT, which has been becoming increasingly popular in recent years.</p>
<p>Ireland</p>	<p>Eurocodes Harmonisation is a good idea for European competitiveness but too vague and poorly administered. Not enough Government direction is being given to them.</p> <p>Environmental impact assessments These are treated very seriously. They are essential for major developments.</p> <p>Use of information and communications technologies (ICT) We do not believe that enough is being done to implement Information and Communications Technology in Ireland, the government is not totally behind it with resources. The Institution of Engineers of Ireland has set up an ICT division due to demand from members.</p>
<p>Italy</p>	<p>Eurocodes The Eurocodes implementing the Directive 89/106/EEC on the construction materials are used increasingly, coupled with the national technical provisions relevant to concrete and pre-stressed concrete in the building and in infrastructures' sectors. The Ministerial Decree 9.1.1996 refers to the Eurocode ENV1992/1/1. As concerns the seismic effects, a new technical update is being elaborated and refers to the seismic Eurocode 8. It goes beyond Law 64/1974.</p> <p>Environmental impact assessment Any important work, in particular relevant to infrastructures, shall be accompanied by analyses of its relevant environmental impact assessment.</p> <p>Use of information and communications technologies (ICT) The use of ICT is significantly increasing in professional offices both for mail and for designs.</p>
<p>Latvia</p>	<p>Eurocodes Latvia State Standard is responsible for implementing Eurocodes as EN. We have some experience with using Soviet GOST, which also have tried to harmonise requirements in former Soviet republics.</p> <p>Environmental impact assessment Environmental Impact Assessments has to be carried out in accordance with Latvian legislation.</p> <p>Use of information and communications technologies (ICT) Yes, it is increasing rapidly.</p>

<p>Lithuania</p>	<p>Eurocodes Lithuanian Standards Board in the main body for implementation of Eurocodes and EN. Lithuania is following preparation of EN and transforming them into Lithuanian Standards (LST). Implementation of harmonised standards is the main priority.</p> <p>Environmental impact assessments Implementation of EU legislation documents and environmental policy is under the responsibility of Environment Strategy and Environment Quality Departments of the Ministry of Environment of Lithuania.</p> <p>Use of information and communications technologies (ICT) The use of ICT is increasing very significantly.</p>
<p>Poland</p>	<p>Eurocodes Our opinion of Eurocodes and how they will affect the construction sector in our country is generally positive.</p> <p>Harmonisation of codes provides an opportunity to unify the law in the field of civil engineering</p> <p>Environmental impact assessment These are dealt with rationally, according to Polish Environment Protection Law.</p> <p>Use of information and communications technologies (ICT) We believe that enough is being done to implement ICT in our country, but that very much must still be done. The use of ICT is increasing.</p>
<p>Portugal</p>	<p>Eurocodes are technical texts of the highest quality and are already taught in university courses. National codes are planned to be substituted by eurocodes, but today both are used in important projects. The main problem is they are too complex and till now they are more considered as a reference technical text.</p> <p>Environmental impact assessment These are dealt with according to the relative EC directives.</p> <p>Use of information and communications technologies (ICT) At design level this is well developed. All design offices currently use ICT. E-procurement and e-business is beginning its implementation in construction.</p>
<p>Romania</p>	<p>Eurocodes The activity for drawing up the Eurocodes aims at accomplishing a number of objectives that may be grouped in three groups:</p> <ul style="list-style-type: none"> • Legal – to support the Community directives and to lead to getting an open market as far as services and products/materials are concerned • Professional – to supply general rules for economic designing, the definition of reliability being included • Industrial – to increase the efficiency of the European building industry and its competitiveness worldwide <p>The transformation period of ENV into EN will take another 2-3 years, the co-existence of the national designing codes and of the Eurocodes may take another five years to which may be added a period of time when the national design codes are maintained as valid.</p>

<p>./. Romania</p>	<p>The following are some of the factors that may influence this latter (i.e. maintaining of the national codes) period:</p> <ul style="list-style-type: none"> a) the need to support the existing regulations and their associated documents b) the specialists' need to use the current information referring to designing c) the extension to which the new standards of products adapt the existing products d) further use of the products in accordance with the national standards to which reference is made in the national designing codes e) impossibility of drawing up the EN standards for products in a relatively short period of time f) the capacity of each state to use its equipment and manpower to use the new products <p>The future European norms are expected to no longer present incompatibilities with the national norms. Under these conditions, each of the national institutes of the member states, as part of the action of taking over of these norms, will determine which of the levels of performance specified in the EN will be applied nationally and alternative performance criteria will be defined, if required.</p> <p>The action of drawing up the Romanian codes CR in agreement with the structural Eurocodes is of a great importance that should be supplemented by a dissemination action so that they are known by the engineers that are to apply them or that will be in contact with these norms.</p> <p>This paper may be used in the programme for drawing up the Romanian designing codes and the other associated technical regulations on materials, products, tests, execution, use, interventions etc.</p> <p>Environmental impact assessment</p> <p>Currently, all construction projects must have an environmental impact assessment, which is provided by the National Environmental Agency, through its branches in the territory. For important projects, studies of environmental impact are elaborated by specialised institutes with accreditation in the field.</p> <p>Use of information and communications technologies (ICT)</p> <p>ICT role increases, even it was not used enough.</p>
<p>Russia</p>	<p>Eurocodes</p> <p>A positive opinion of Eurocodes. Some Russian Construction Codes (SNIP) are taking Eurocodes in account if it is rendered legitimate.</p> <p>Environmental impact assessments</p> <p>This is dealt with by the Russian Environment Protection regulations.</p> <p>Use of information technology in the sector</p> <p>There is an effort being made to increase use of ICT, but this is not enough to catch the older generations. Generally, use of IT is increasing.</p>
<p>Slovak Republic</p>	<p>Eurocodes</p> <p>The European harmonisation in the construction sector is certainly a big step forward. Eurocodes can ensure the safety and stability of construction works and will make the free movement of building products within EU much easier. Euro-codes are considered to be a complex issue which needs a strong</p>

<p>./. Slovak Republic</p>	<p>involvement in a relatively short time. They are already incorporated in the subjects taught at various educational organisations, mainly at the civil engineering faculties in Slovakia.</p> <p>Environmental impact assessment</p> <p>Environmental Impact Assessment procedure in the Slovak legislation is adjusted by the Act No. 127/1994 of the National Council of the Slovak Republic on the Environmental Impact Assessment, and Act No. 391/2000 Coll. amending the Act No. 127 / 1994. By approval of this act, legal regulations in the field of environmental impact assessment in Slovakia have been harmonised with the legal regulations of EU. The whole assessment process in the Slovak Republic is managed and regulated by the Ministry of the Environment of the Slovak Republic, the Environmental Impact Assessment Section.</p> <p>Use of information and communications technologies (ICT)</p> <p>The use of ICT in the civil engineering sector is currently increasing in Slovakia.</p>
<p>Slovenia</p>	<p>Eurocodes</p> <p>It is foreseen that the system of Eurocodes will be applied by a special Slovenian Code in the year 2007. The EC will replace existing national regulations relating to civil engineering design.</p> <p>Environmental impact assessment</p> <p>This field is covered in Slovenia by a special Environment Protection Act. A feasibility study covering environmental protection has to be part of the design documentation presented to the state authorities in the procedure to obtain a construction permit.</p> <p>Use of information and communications technology (ICT)</p> <p>The use of ICT is increasing in Slovenia. It has become a standard subject in civil engineering courses at universities and also this is the normal tool for making structural analyses and drawings in the design firms.</p> <p>We think that there is one general problem in the use of software. Newer and still newer versions make the use of this tool too complicated for quick response and implementation of the newest versions of software into commercial use.</p>
<p>Turkey</p>	<p>Eurocodes</p> <p>The Turkish Standards Institution (TSE) governs the standardisation of all disciplinary issues and principles. Eurocodes are being observed by Turkish civil engineering sector recently, and the general intent is through usage of Eurocodes in Turkey. The preparation studies for Eurocode implementations for the standardisation sector of Turkey are being realised at the present.</p> <p>TCCE is solely supporting Eurocode usage in Turkey, referring to the advantages and benefits of global standard applications. The common goal of international sectors and chambers will be achieved by providing the same or similar constraints in the civil engineering implementations.</p> <p>The accession states are focussed on legislations and regulations about general contract issues, qualified engineering problems and professional recognition concept. As these seem to be the fundamental changes to be made in Turkey, it is seldom the case that states focus on codes and standards at present.</p>

<p>./. Turkey</p>	<p>Recently, there have been new implementations to the standardisation system. Accreditation Association is realising the determination and control of standards gradually.</p> <p>In addition, CE marking criteria will be applied to all implementations, within the following year, which provides another standardisation from a global point of view. These recent developments are included in European Union adaptation process.</p> <p>Environmental impact assessment</p> <p>There are regulations on environmental impact issues and applied properly for both public and private sectors. The Environmental Impact Assessment Regulation covers up the essential features to be responsible from and related obligations for all civil engineering applications.</p> <p>Use of information and communications technologies (ICT)</p> <p>ICT has been commonly being used in all areas of civil engineering. The implementation of ICT to the sectors started with private sector applications, and developed rapidly. Public sector followed these developments rather deliberately, but caught up and settled ICT involvement in every area within a remarkably short period of time. As the human involvement in ICT usage is essential, most of the problems or difficulties in implementation resulted from employers getting used to ICT.</p>
<p>United Kingdom</p>	<p>Eurocodes</p> <p>ICE had decided to take an active approach towards the introduction of Eurocodes, and has launched a website (http://www.eurocodes.co.uk/) to assist members and the construction industry in understanding and dealing with Eurocodes.</p> <p>Thomas Telford, the commercial arm of the Institution, is organising training courses in the different Eurocodes.</p> <p>Environmental impact assessment</p> <p>Environmental impact assessments are carried out in the UK in accordance with the Council Directive on Environmental Impact Assessment (EIA Directive) of the effects of projects on the environment, as introduced in 1985 and amended in 1997.</p> <p>The process involves an analysis of the likely effects on the environment, recording those effects in a report, undertaking a public consultation exercise on the report, taking into account the comments and the report when making the final decision and informing the public about that decision afterwards. Environmental assessment is undertaken for individual projects such as dams, motorways, airports or factories.</p> <p>Use of information and communications technologies (ICT)</p> <p>ICT is increasingly used in UK construction business, and has become a standard subject in civil engineering courses at universities.</p> <p>ICE has an ICT panel which considers questions relating to the use of ICT in civil engineering and promotes best practice in IT management systems.</p>

CHAPTER 17

MEMBERSHIP STRUCTURE AND NUMBERS

The questions asked of members were:

- 17.1 *Grades of Membership*
(e.g. fellow, ordinary, student, retired)
- 17.2 *Total number of Members*
(for multi-disciplinary organisations, the total number of civil engineers is expressed in brackets)

COUNTRY	Grades of membership	Number of members (Period 2003-4)
Croatia	Ordinary	3,100
Cyprus	There is no grade.	1,600
Czech Republic	Institute Chamber	2,500 21,000
Estonia	FOSR	342 (+2)
Finland	Ordinary Student Retired Total	3,500 1,000 500 5,000
France	Individuals	160,000
Germany	Ordinary	3,500
Greece		
Hungary	1. Candidates and members without licence 2. Member 3. Member with professional licence (planning and expertise is bound by law to the licence granted by Chamber)	17,380 engineer members, including 5,590 civil engineers
Ireland	There are 7 grades of membership from student to Fellow, the most senior grade	22,000
Italy		
Latvia	Latvian Association of CE Ordinary members Associated members students	626 37 23

Lithuania	Ordinary	900
Poland	Polish Association of Civil Engineers and Technicians: Ordinary Student Retired All 6 associations acting in the range of civil engineering: Polish Chamber of Civil Engineers: Ordinary	6,000 600 1,500 15,000 102,000
Portugal	Student Training Engineer Senior Consulting	13,000
Romania	The Union of Associations of Civil Engineers of Romania - UAICR is composed of 11 professional associations with a cumulated membership of over 6,000.	Individual members of various associations pay modest fees to the respective association. In turn, each association gives a certain percentage to UAICR.
Russia	Ordinary	400 in Moscow and Moscow Region, 2,900 all around Russia.
Slovak Republic	Authorised Engineer (compulsory membership) Voluntary Member – Natural Person (building site managers, building invigilation officers, students, retired) Voluntary Member – Legal Person Visiting Member (from countries other than Slovakia – authorised civil engineers, building site managers and building invigilation officers, etc.).	4,456 281 59 433
Slovenia	Ordinary	5,500 (2,250 civil engineers)
Spain	There is only one grade of membership which is 'Ordinary'	19,000 members in total
Turkey	Ordinary, student, retired	64,707 (at 15.04.2005)
United Kingdom	Fellow Member Associate member Technician Member Graduate Student (on non-accredited courses)	6,024 41,025 3,288 542 14,343 6,251

PART B

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Chapter 1 - THE EDUCATION SYSTEM

Questions: *General Education System*
Environmental Training within the Civil Engineering Education
Bologna Process
Foreign Language Learning

COUNTRY	Education System	Environmental Training	Bologna Process	Foreign Language
Croatia	4,5 y. BA (Grad.Civ.Eng.) 2 y. Master, also 3 y. Civ.Eng.(Technical High School)	Yes, compulsory and voluntary	3+2+3 (Bachelor-Master-PhD), also 4+1+3 system, starting 2005/6	Engl.+German obligatory / others optional
Cyprus	3 y. Technician Engineer New courses at new University	Part of education, even courses Civ.Eng and Environment	Totally in new Uni since 2003	English obligatory, others optional
Czech Republic	5 years	Very important specialities, but also embedded	4+1+X since 2003/4	English obligatory, others optional
Estonia	4 y. Technical Institute 5 y. University	Embedded	(3+2=) 5 years since 2002	English obligat. , others optional
Finland	> 5 y. Technical University 4 y. Polytechnics	Obligatory modules, much emphasis	3+2+X from 2005/6	Swedish,English, (German)
France	5 years Ingénieur Diplôme	No specific studies, embedded	3, 5, 8-system in progress	English obligat., others voluntary
Germany	> 5 y. Technical University 4 y. Fachhochschule	No specific studies, embedded	3+2+3 mostly 2005/6	English mandatory, Others: French, Spanish,Chinese
Greece	5 y. of universities	No specific studies, embedded	Not yet installed	Voluntary
Hungary	5 y Technical University 3 y. Institute of Technology	Embedded	4+1, 5+3 mostly 2005/2006	Voluntary
Ireland	5 y. at University 4 y. at Institute of Techn.	Embedded	(3+2=) 5 years integrated Master	Voluntary
Italy	3 y. Laura 5 y. Laura specialistica	Embedded	3+2 since 2000	English obligat., others voluntary
Latvia	4,5 Bachelor+1 Master since 2004	Embedded	Implemented since 1996	English (mainly) or German
Lithuania	4 Bachelor+2 Master since 2000	Uni. Of Vilnius special Environment. Faculty	In work	Voluntary
Poland	5,5 y. Master	Number of specific curricula	5 y. Engineer and 3+2 (Bach./Master)	Yes, different
Portugal	5 y. University 3 y. Polytechnic	Mandatory modules	3+2 or 4+1 not yet decided	Foreign language from school
Romania	3 y. Inginer colegiu 5 y. Inginer diplomat	Special curricula, others: no mandatory modules	3-4 + 2-1 from 2005/6	Russian, now Engl. and others
Russia	5,5 y. Dipl. Engineer 4+2 Bachelor to Master Academic	Embedded	4+1 or 4+2, for special program 5+2 from 2007/8	English, also German, others voluntary

Slovak Republic	5 years	Embedded, study programme at some faculties of civil engineering	3-4 (Bachelor) + 5 (Master) + 3 (PhD)	Usually one foreign language subject is mandatory (English, German or French)
Slovenia	4 y. of universities	Included in some obligatory courses		Usually two foreign languages
Spain	5 years (6 years) Escuela de Caminos (university)	No mandatory modules, some optional	4 years + 6 months End of Degree Project + 1 or 2 yr Master + Doctoral Degree	English mandatory, others optional
Turkey	4+2-tier system 4+2 Bachelor/Master	Embedded	4+2 like before 4+1 (without thesis)	English at school, German by family contacts
United Kingdom	3 y. BEng+Matching 4 y. MEng/BEng (hon.)	Numerous obligatory modules normally embedded	No movements	Some offers, but not mandatory

ECCE's Partner Organisations

American Society of Civil Engineers (ASCE)
Japan Society of Civil Engineers (JSCE)

COUNTRY	Education System	Environmental Training	Bologna Process	Foreign Language
USA	4 years Master	Numerous obligatory modules, normally embedded	Licence after equivalent 5 years Master	Some efforts, but not mandatory. Western part US: Spanish
Japan	4 years Bachelor + 2 years Master	Numerous obligatory modules, normally embedded	Remaining to 4+2+3 system	English mandatory

Chapter 2 - STUDENT NUMBERS

(Numbers per year, data of Year 2003)

COUNTRY	Number of Undergraduates (approx.)	Number of Graduates (approx.)
Croatia	700	200
Cyprus	660 (2001- 2002)	50
Czech Republic	3,000	2,000
Estonia	400 – 600	170 – 195
Finland	220 (MSc) 800 (Polytechnic)	110 (MSc) 500 (Polytechnic)
France		1,700
Germany	6,100 (2002)	5,700 (2002)
Greece		1,000
Hungary	730	550
Ireland	1,700	1,700
Italy	38,765	6,,003
Latvia	315 (2003) 380 (2004)	164 (2003) 214 (2004)
Lithuania	2,600	1,990
Poland	8,000 – 10,000	5,000 – 6,000
Portugal	800	500
Romania	1,800	1,200
Russia	30,000	21,000
Slovak Republic	1,720	790
Slovenia	796	228
Spain	1,500	1,200
Turkey	3,500	3,000
United Kingdom	15,452 (2001)	19,800 (2001)

ECCE's Partner Organisations

**American Society of Civil Engineers (ASCE)
Japan Society of Civil Engineers (JSCE)**

COUNTRY	Number of Undergraduates (approx.)	Number of Graduates (approx.)
USA	-	-
Japan	-	8,000

Chapter 3 - RECOGNITION AND PROTECTION OF PROFESSIONAL TITLE

Questions: *Is there any legislation in your country that obliges you to have a certain qualification in order to carry out the profession of civil engineer?
Is the title of "civil engineer" or "Graduate Engineer" or similar, protected under law?*

COUNTRY	Legislation	Protection of title by law
Croatia	Yes by Building Law (2003) Formal requirements	Yes Civil Engineer, Graduate Civil Engineer
Cyprus	Yes by authorisation of Cyprus Technical Chamber	Yes Civil Engineer
Czech Republic	Yes by authorisation by Chamber	Yes Bachelor of Science, Master of Science
Estonia	Since 2003 title of Bachelor and Master of Science	Yes, Civil Engineer, Applied Engineer
Finland	Yes by Building and Land Use Law to "quality requirements"	Yes Engineer
France	No no protection of title of Civil Engineers	Yes "Ingénieur Diplômé de l'Ecole de". No, for all others.
Germany	Yes (Law of Bundesländer) Diplom-Ingenieur (Dipl. Ing.)	Yes (Law of Bundesländer) Diplom-Ingenieur (Dipl. Ing.)
Greece	Yes By law 4663/1930	yes
Hungary	Yes	Yes
Ireland	Yes	Yes Chartered Engineer
Italy	Yes Royal Decree, Art. 167 (31 Aug. 1933)	Yes Ingegnere Civile e Ambientale (iunior), Ingegnere Industriale (iunior)
Latvia	Yes by Building Law, Law on higher education	Yes Engineer, Bachelor, Master, Dr.sc.ing.
Lithuania	Yes	Yes Bachelor and Master of Science
Poland	Yes	Yes
Portugal	Yes Authorisation by Ordem dos Engenheiros	Yes Civil Engineer

Romania	No	No
Russia	Yes	Yes Civil Engineer, Bachelor and Master Academician
Slovak Republic	Yes Authorisation by the Slovak Chamber of Civil Engineers Act No. 138/1992 Coll. on Authorised Architects and Authorised Civil Engineers	Yes The title "Authorised Civil Engineer" is protected under law (authorisation is issued by the Slovak Chamber of Civil Engineers)
Slovenia	Yes accord. to ZGO and special examinations	Yes and after completion of university studies
Spain	Yes	Yes
Turkey	No	No
United Kingdom	No but authorisation by ICE	Yes Chartered Engineer, Corporated Engineer, Engineering Technician

ECCE's Partner Organisations

American Society of Civil Engineers (ASCE)
Japan Society of Civil Engineers (JSCE)

COUNTRY	Legislation	Protection of title by law
USA	-	-
Japan	No	No a regulation system is under way (PEJ)

Chapter 4 – TRAINING

Questions: *Is a period of professional training compulsory as part of the undergraduate study? If so, for how long is training required? and/or Is a training period required after graduation?*

COUNTRY	Undergraduate Training	Postgraduate Training
Croatia	4 weeks in summer	3 to 5 years to gain special licences training periods to obtain status
Cyprus	Depends on country of study	1 year (2 years in future)
Czech Republic	No	No
Estonia	Yes (no time given)	No (depends on company)
Finland	Minimum 6 weeks at University, 7 months at Polytechnics	No
France	Time varies from some weeks to 1 year	No
Germany	No, at Technical Universities 1 or 2 semesters at Fachhochschule (FH)	No, for normal work some years for specialists
Greece	No (only for technicians)	No
Hungary	No	2 for 5 years' education, 5 for 3 years' education, 10 for specialists
Ireland	No	4 years
Italy	No	Not compulsory, but normally 6 months
Latvia	26 and 32 weeks	3-5 (8) years before to get Certificate
Lithuania	8 weeks in three different topics	No, but companies have their own programme
Poland	Yes, a period of ...(<i>unspecified</i>)	From 2 x 1 month to 4 x 1 month
Portugal	No, but indirectly necessary after graduation	6 months under supervision of an older member of OE
Romania	2 x 1 month in summer	No regulation, but up to 2 years sometimes necessary
Russia	Yes, 23 weeks	Not compulsory
Slovak Republic	About 2 months as a part of graduate study	Different, but strictly regulated, depending on the specialisation
Slovenia	22 weeks for undergraduate 4 weeks for graduates	1 year 2 years additional for licensing
Spain	No	No
Turkey	45 days	No
United Kingdom	No	Regulated training periods of 3-6 years' duration

ECCE's Partner Organisations

American Society of Civil Engineers (ASCE)
Japan Society of Civil Engineers (JSCE)

<i>COUNTRY</i>	<i>Undergraduate Training</i>	<i>Postgraduate Training</i>
USA	No	1-2 years before licensing
Japan	No	Not mandatory, but several months are provided by companies

Chapter 5 - SERVICES OFFERED BY PROFESSIONAL CIVIL ENGINEERS

Questions: *What services may be offered by civil engineers in your country?*

COUNTRY	Normal Services	Special Services	Prohibited Services
Croatia	Infrastructure, Building supervision, Projects, Bridge Engineering, Building Materials Technology, Construction Economics and Management Environmental Protection, Highway Engineering, Transportation Engineering, Soil Mechanics, Foundation Engineering, Steel Structures, Structural Engineering, Building Physics, Structural Mechanics, Water Resource, Water and Wastewater Engineering	Design as civil engineer	Architectural design
Cyprus			Architectural design since 1993
Czech Rep.		Selected public activities	
Estonia			
Finland			
France		Functional and operational levels in public and industry	
Germany		Statistics (Prüfingenieur) Public Supervision	Architectural design
Greece			
Hungary			
Ireland		Even architectural design	
Italy		Differentiation between "adult" and juniors	
Latvia		Expertise	
Lithuania			
Poland			
Portugal		Architectural design for "big" buildings	
Romania			
Russia			
Slovak Rep.		Complex architectural and engineering services and related technical consulting services (To be authorised by the Slovak Chamber of Civil Engineers)	Authorised civil engineers may practise their professional activities only in the categories they were authorised by the Slovak Chamber of Civil Engineers in accordance with the Act No. 138/1992
Slovenia			

Spain	(Geotechnics, Coastal Engineering valid for Turkey)	Others: town and country planning; thermal, nuclear power plants; airports;	Design of dwellings not allowed, (structural calculus yes, however)
Turkey		Designing and inspection engineering	Architectural design
United Kingdom		Construction of dams public inspector	

Chapter 6 - NUMBERS OF QUALIFIED ENGINEERS

(Years 2002 – 2004)

Questions: *How many qualified engineers are there in your country at present?
(If providing figures, please specify the date these figures were produced).
If at all possible, please provide figures according to the categories you use
in your country.*

COUNTRY	Number of Qualified Engineers at present (approx.)	Categories of Qualified Engineers (approx.)
Croatia	5,000	
Cyprus	2,200	
Czech Republic	90,000	50,000
Estonia	Some hundreds	
Finland	5,300 (MSc) 12,600 (BSc)	
France	70,000	8,000
Germany	1,000,000	40,000
Greece	25,000	
Hungary	20,000 – 25,000	
Ireland	60,000	
Italy	285,000	
Latvia	4,600	2,000
Lithuania	Currently not available	
Poland	2,900,000	200,000
Portugal	50,000	12,800
Romania	43,000	43,000
Russia	No official statistics	
Slovak Republic	30,000	
Slovenia	No official statistics	
Spain	19,000 civil engineers	19,000 civil engineers

Turkey	80,000, the “qualified engineer” concept has not been officially used in Turkey yet: it is planned to start this in 2005.	
United Kingdom	70,000	46,415

Chapter 7 - PROFESSIONAL ORGANISATIONS AND REGISTRATIONS

Questions: *Are civil engineers obliged to register (e.g. with a state organisation or Chamber of Engineers) in your country*
Are there voluntary professional organisations for civil engineers? What are they called, and which types of civil engineers do they represent (e.g. contractors, consultants, structural engineers)?
Is your association permitted to have any interest in the commercial interests of its Members?
Are there professional sectoral societies in particular fields/specialisations (e.g. concrete, geotechnic)?

COUNTRY	Registration (necessary)	Voluntary Membership	Commercial Interest	Sectoral Societies
Croatia	For special work	Normal	No	Many
Cyprus	Yes	Choice between two	Interest in "interests"	No, only committees
Czech Republic	Yes	Choice between two	No	Many
Estonia	Yes			Some
Finland	No	Normal (in similar associations)	No	Many
France	No only geodetic surveyors	Normal (in similar associations)	No	No. many divisions
Germany	No	Normal (in similar associations)	No	Many
Greece	Yes in chamber	Voluntary in societies	No	Many
Hungary	Yes	Also in others	Association yes Chamber no	Many
Ireland	Yes		No	Many divisions
Italy	Yes (at provincial level)			Many divisions
Latvia	No	Also in others, normal	Yes	Some
Lithuania	No	Normal, also in others	Yes	Some
Poland	Yes for independent activity	Normal, also in many others	Yes	Many
Portugal	Yes	Additional also	No	Many

Romania	No	Yes in some others	No	Some
Russia	No	Yes	No	Many
Slovak Republic	Authorised civil engineers are obliged to register with the Slovak Chamber of Civil Engineers	Yes, also in others	No	Many
Slovenia	Yes for licensing	Yes, in a number of societies	No	
Spain	Yes	Yes, Asociación de Ing. de caminos	No	Yes, related to all sectors of civil engineering
Turkey	Yes (the civil engineers who are interested in designing)	Yes in many others	No	Many
United Kingdom	No	Normally yes	No	Many

Chapter 8 - LEGAL BACKGROUND TO THE PROFESSION

Questions: *Are there legal restrictions to the functions?
How are building and construction laws regulated?
Is there personal liability for damage, defects, etc.?*

COUNTRY	Legal Restrictions	Regulation of Activity	Personal Liability
Croatia	Yes, by Building law	Total responsibility to contractor	Yes
Cyprus	Yes	Local authorities (district, town)	Yes
Czech Rep.	Yes	Regulated by law	Governed by common law
Estonia	Licence necessary	Planning Law, Construction Law	Yes, depending on contract agreement and insurance
Finland	Yes, not necessary for certain functions	Ministry of Environment	Normally no
France	Only general rules	Code Civil, Code Penal	Normally no, depending on agreements
Germany	Yes	Building Law of State and Province	Yes, due to common law
Greece	Yes	Yes by law	Yes
Hungary	Yes	Building Law, Environment Law	Yes
Ireland	Yes	Statutory Bodies, Local Authorities	It depends on case and circumstance
Italy		Codice Civil (Civil Code)	No obligation to have insurance
Latvia	Yes	Building Law	No obligation to have insurance
Lithuania	Licence necessary	Building Law	Depending on contracts
Poland	Member of Chamber	Polish Building Law	Yes
Portugal	Yes	(National) Law	Yes
Romania	No	Law of Quality in Construction	Yes
Russia	Yes	Local and state authorities (region, town)	Yes
Slovak Rep.	Yes	e.g. Building Act; Act on Authorised Architects and Authorised Civil Engineers; Act on State Administration for Territorial Planning, the Construction Code and Housing; Civil Code, etc.	Yes
Slovenia	Yes	Yes (ZGO)	Yes

Spain	Yes	National Law	Common Law
Turkey	(Very poor)	Ministry of Prosperity (but poor)	Unsolved problem
United Kingdom	No	Separate Building Regulation	Yes

Chapter 9 - CONTRACTS

Questions: *Is a client free to adopt any type of contract (s)he wishes?*
What particular types of contract are used?
What is the most common system for tendering for public projects in your country?
Is the normal criteria, lowest tender?
What other criteria may be taken into account?
Is electronic tendering used frequently in your country? Is it, or will it soon be obligatory?

COUNTRY	Adoption to Contr.	Types of Contract	Tendering System	Criteria	Electronic Tendering
Croatia	Yes	Turn-key, fixed price	Public Procurement (related to EU)	Mostly lowest price	No
Cyprus	Yes	Unit price, FIDIC contracts	Public Procurement (related to EU)	Mostly lowest price	Sometimes
Czech Republic	Yes	No restriction	Technical, financial reliability	Mostly lowest price	Not frequently used
Estonia	Yes	No restriction	Public tenders: open	Mostly lowest price	Not obligatory
Finland	Yes	No restriction	Public/open	"Most economic", lowest price	Normal
France	Yes	Law MOP for public contracts		Lowest price	Not yet developed
Germany	Yes	VOB is normal	Public/open	Lowest price but	More and more in use
Greece	Yes	Public works contracts	Public/open	Mostly lowest price	Not yet
Hungary	Yes	Normal	Within EU directive	Lowest price but	Not frequently used
Ireland	Yes	IE, FIDIC, ICE	Within EU directive	Lowest price but	Not frequently used
Italy	Yes	Law Decree	Within EU directive		Not allowed
Latvia	Yes	Law on State and Municipality procurement, national contract conditions, FIDIC	Open, public tenders	Lowest price, experience	Not yet developed
Lithuania	Yes	International FIDIC	Open tender for public price	Lowest price	Not allowed
Poland	Yes	Polish Codex of Civil Law for civil contract	Polish Tendering System	Lowest price	Not frequently used
Portugal	Yes	Portuguese Law	Public Tender	Lowest price	Not frequently used but developing fast

Romania	Yes	In accordance with Law No.10	Public Tender		Used for public investment, leads to extension
Russia	Yes	Turn-key, fixed price	Public Procurement	Mostly lowest price	Not often
Slovak Republic	Yes	No restrictions; in accordance with the Slovak legislation	Public Procurement	Usually the lowest price but also the date of construction, quality, complexity of delivery, constructional and technical solutions	In use, but not obligatory
Slovenia	Yes	No restriction	Public Procurement	Mostly lowest price	Not yet
Spain	In private business yes; diff for Public Admin	Ruled by Law <i>Ley de Contratos con Las Administraciones Publicas</i>	3 types of tenders	Depending on type of tender	Scarcely developed
Turkey	Yes	Many	Lump sum techn., BOQ (mostly used)	Lowest price	Not used
United Kingdom	Yes	Joint Contracts Tribunal (JCT) ICE, New Engineering Contract (NEC)	In accordance with Public Procurement	"Value for money", PPF, PFI Different	Not frequently used

Chapter 10 - FEE SCALES, SALARIES AND TAXATION

Questions: *Is there a Scale code of fees in your country? If so, is it approved by law?
Is the tendering price free, or are there any rules for calculating this?
Are civil engineers subject to normal national taxation?
What do you believe is the average salary and percentage of tax paid on that salary in your country?
What rate of VAT (Value Added Tax) is paid in your country?*

COUNTRY	Fee Scales	Salaries [expressed in €] normally per month	Taxation Rate [%]	VAT RATE [%]
Croatia	Free in private sector, by law in public sector	Average 933	20-35	22 / 20 in future
Cyprus	Free, scale code of fees	Annual 11,000–55,000 Average 25,000	4 scales 0-30	15
Czech Republic	Free, scale code of fees, only recommended	Average 550	15-40	22 / 19 in future
Estonia	No fee scale		Normal	18
Finland	No fee scale, prohibited by law	Average 4,200	~ 35	22
France	Details published in CNISF documents	Average annually 28,000 public/ 31,000 private	Normal	19.6
Germany	Scale based on law HOAI, privately free	Annual average of 50,000	35	16
Greece	Fee scale determined by law (696/74)	-	30-40	19
Hungary	Fee scale not approved by law, free private	Average 1,200	40	25
Ireland	No scale, free tendering	Depending on experience approx. 10 years: 50,000	Normal	21 (13,5)
Italy	Fixed minimum fee by law, free tendering		Normal	20
Latvia	No scale, free tendering	Average 1,000	Normal	18
Lithuania	No scale, free tendering		Normal	18
Poland	No scale, free tendering	Average in 2003: 600	19-40	22 (7)
Portugal	Fee scales by law tendering free	After 5 years average 35,000	30	19
Romania	Scale free within each company, minimum scales by law	Minimum average: 100 normal average: 250	18-40	19
Russia	Free in private sector, by law in public sector	Starting from EURO 300-500	13% by employee 26% by employer	18%

Slovak Republic	No fee scale, free tendering	Average 500-600 (authorised civil engineers)	19	19
Slovenia				
Spain	In private business yes; different for Public Admin.	Ruled by Law <i>Ley de Contratos con Las Administraciones Publicas</i>	3 types of tenders	Depending on type of tender
Turkey	Specific public fee scales within minimum fee, private free tendering	Average 1,200	37	18
United Kingdom	No standard fee scale tendering price free	Professional engineers and technicians GBP 32,086 per annum, Chartered engineers GBP 49,997 per annum	25-34	17,5

Chapter 11 - INSURANCES AND PROFESSIONAL LIABILITY

Questions

Is there mandatory insurance for civil engineers in your country?

Who is responsible for professional liability insurance?

Do companies have their own liability insurances?

COUNTRY	Mandatory Insurance	Responsibility for Insurance	Company Insurance by their own
Croatia	No (only for work accident)	Company	No
Cyprus	No	Company	Normally no, in public work it is sometimes necessary
Czech Republic	Yes	Individuals and Chamber	Yes
Estonia	No		Yes
Finland	No	RIL has it as part of membership fee	Yes
France	Yes	Public authorities: no Company: Yes	Yes
Germany	Yes, in some federal states for designers	Each individual	Yes
Greece	No	Each individual	Yes
Hungary	No	No one	May have
Ireland	Yes	Individuals, companies	Yes
Italy			
Latvia	No	No	No
Lithuania	No	No one	No
Poland	Yes	Individuals Polish Chamber of Civil Engineers	Yes
Portugal	No	Individuals Civil Engineers partly Ordem	No, only few companies have it
Romania	No		No
Russia	No (only for work accident)	Company	No
Slovak Republic	Yes for authorised civil engineers	Civil engineers can insure themselves individually or through the Slovak Chamber of Civil Engineers	Yes

Slovenia	No	Individual	Yes
Spain	No	Individually by becoming a member of the Colegio	Yes
Turkey	No	Open question	Yes, on voluntary basis
United Kingdom	No, but in practice everyone is insured	Individual	Yes

Chapter 12 - SOCIAL SECURITY

Questions: *Do you pay social security yourself or does your employer pay it?
Are there any special unemployment funds that can be accessed by civil engineers?
Are there compulsory contributions for health service and pension in your country?*

COUNTRY	Security Payments	Unemployment Fund	Health and Pension Contribution
Croatia	By employer	At worker union and state level	Yes, paid by employer
Cyprus	Both by employer and employee	Compulsory	Will be compulsory
Czech Republic	Both by employer and employee	Only on a general basis	Yes
Estonia	By employer		Included in Estonian pension system
Finland	Both by employer and employee	Especially for engineers, architects and economists	Contribution by company to government tax
France	Both by employer and employee	National «Caisse de Retraite Complémentaires»	Yes, paid by both, employer and employee
Germany	Both by employer and employee	General fund	Yes, as general system with private additional support
Greece	Both by employer and employee	General fund	Yes, as general system with private additional support
Hungary	Both by employer and employee	Special fund for civil engineers and others	Yes, as part of national system
Ireland	Both by employer and employee	No special funds	Yes, compulsory contribution to national system
Italy	Contribution by employee depending on salary	Special funds for construction sector	Yes, compulsory national and additional private system
Latvia	Both by employer and employee	Only on a general basis	Yes, compulsory national and additional private system
Lithuania			
Poland	Usually the employer	Special funds for civil engineers	Yes, compulsory
Portugal	By employee 11 % By employer 24.5%	General system	Yes, compulsory
Romania	Both by employer and employee, freelancers by themselves	General system	Yes, compulsory

Russia	By employer	At state level	Yes, paid by employer
Slovak Republic	Both by employer and employee	General system	Yes, compulsory + the possibility of supplementary pension insurance
Slovenia			
Spain	By employer and by employee	Only the general public unemployment funds	Yes compulsory contribution to public system
Turkey	By employer	Newly funded, not yet clear	Yes, but ineffective system
United Kingdom	Both by employer and employee	General system ICE operates a special fund	Yes, compulsory

Chapter 13 - CIVIL ENGINEERING PRACTICE

Questions: *In which sectors do civil engineers work in your country?
Do you have figures to indicate the percentage of engineers in the following?*
 - Private sector: consulting, contracting, materials industry
 - Public sector: local authorities and national authorities

COUNTRY	Private Sector consulting, contracting, materials industry	Public Sector local / national
Croatia	70% in all sectors	20% in national water management, power management, railway, highways
Cyprus	Nearly all in all sectors	10-15% (water management)
Czech Republic	75% in all sectors	25% in all sectors
Estonia	In all sectors	
Finland	28%, 16%, 6%; "rest" 13%	16%, 21%
France	75% in all sectors	25% in all sectors
Germany	80% in all sectors	20% in all sectors
Greece	About 70% in all sectors	About 30% in all sectors
Hungary	In all sectors	
Ireland	80%	2 %
Italy	Civil Engineers not practising as free professionals	
	26 %	74 %
Latvia	On average 20,6% local and state authorities, (2003/2004 year figures)	On average 79,4% - private (2003/2004 year figures)
Lithuania	In all sectors	
Poland	60-70%	In all sectors 30-40%
Portugal	80%	In all sectors 20%
Romania	In all sectors	
Russia	70%	30%
Slovak Republic	70%	In all sectors 30%
Slovenia	About 75%	about 25%
Spain	84%	16%
Turkey	60%	In all sectors 40%
United Kingdom	90%	In all sectors 10%
	(very detailed data are available)	

Chapter 14 - CONTINUING PROFESSIONAL DEVELOPMENT AND LIFELONG LEARNING

Questions: *Is continuing professional development mandatory in your country following graduation?*
How are you promoting lifelong learning amongst your members?

COUNTRY	Continuous Professional Development (CPD)	Lifelong Learning (LLL)
Croatia	Voluntary, but four - five years necessary for special state services	Obligatory by Building Law (2003)
Cyprus	Voluntary, but offers by associations used	Promoted by short special courses etc.
Czech Republic	Compulsory	Chamber publishes guidebook
Estonia	Compulsory, update of certificate every five years	Promotion by associations
Finland	Not compulsory but highly recommended	Promotion by associations
France	Not mandatory but 1.6 % of gross salary if company used for CPD	Promotion by associations
Germany	Not mandatory but highly recommended	Promotion by associations
Greece	Not mandatory but highly recommended	Promotion by associations
Hungary	Not mandatory	Promoted by associations
Ireland	Not mandatory	Promoted with pro-active policy programme
Italy	Not mandatory, in future introduction for CNI members	Promotion by associations
Latvia	Not mandatory	Promotion by associations. Highly recommended to update certificate every five years
Lithuania	Not mandatory, necessary for specialists, state services	Highly recommended to update certificate every five years and helping gaining higher ranks
Poland	Mandatory for members of Polish Chamber	Promotion by associations
Portugal	Not mandatory	Promotion work on creditation of LLL programmes
Romania	Not mandatory	Promotion by associations

Russia	Not mandatory, but necessary for higher qualifications	Promoted by companies, special institutions and Universities
Slovak Republic	Not mandatory, but necessary for authorised civil engineers	Promoted by the Slovak Chamber of Civil Engineers
Slovenia	Not mandatory, but necessary for authorised civil engineers	Promotion by IZS
Spain	Not mandatory	Promotion by the Colegio and other associations
Turkey	Not mandatory	Promotion by associations
United Kingdom	Not in general, but compulsory for ICE members	Promotion by associations, with published guidebook

Chapter 15 - PROMOTION OF THE PROFESSION

- Questions:
- *Publications by member organisations of ECCE*
 - *Engineering Weeks/Days celebrated in member countries*
 - *Activities to make civil engineering studies more attractive to all*

The range of services is set out in a table below. In the field of publications, it is interesting to note that since the last edition of "The Civil Engineering Profession in Europe", a number of member publications are now produced electronically.

SERVICES OFFERED TO MEMBERS: KEY

M/C natnl	Meetings/Conferences organised and held at national level
M/C int	Meetings/Conferences organised and held at international level
Educ	Education courses
CQ	Certification of Qualification is provided by organisation to members
Code/Ethics	Organisation has a Code of Practice or Ethics
Career Guidance	Career Guidance is offered to members
Public Rels	Organisation ensures a public relations function – producing press releases, promotional material etc.
Manuals/Guides	Practice Manuals and Guides are produced on behalf of members to promote best practice
Insurance	Insurance benefits are made available through this organisation to members
Databases	Databases are held
Library	Library facilities are available to members
Govt/Public Aff	The organisation ensures a Government/Public Affairs function whereby members are informed of political and policy developments and the opportunity is given to present views to Government and authorities
Labour	Labour market services are offered to members
Employ	Employment assistance is given
Other	Other services (these are also detailed separately overleaf)

NOTE TO MEMBER RESPONSES:

- Hungary Response:** Under the heading 'Other' : Hungary offers legal advice: professional software and standards at a reduced price
- Italy Response:** Publications are offered to CNI members through its Centro Studi.
- Slovak Republic:**
- ¹ - The members of the chamber can use the library of the Institute of Education and Services, Ltd. as well as the library of the Ministry of Construction and Regional Development of the Slovak Republic
 - ² - depending on the request of the member
- Spain Remarks:** *) will be checked; **) no annex included since in text
- UK* Response:**
- (1) Note:** (√) means that this service is offered through Thomas Telford Ltd., the commercial arm of ICE
 - (2) Other services:** ICE also deals with arbitration, adjudication and disputes in relation to New Engineering Contract

SERVICES OFFERED TO MEMBERS

<u>COUNTRY</u>	M/C Natnl	M/C Int	Educ	Cert. of Quals	Code of Ethic	Car- eer Guid.	Pub- lic Rel s	Man- uals Guid.	Insur- ance	Data- Base	Lib- rary	Gov/ Pub. Affrs.	Lab- our Mar kt.	Em- ploy	Oth- er
Croatia	√	√	√	√	√	no	√	√	√	√	no	√	√	no	√
Cyprus	√	no	√	no	√	√	√	√	no	no	no	no	no	no	no
Czech Rep	√	√	√	√	√	no	√	√	√	√	√	√	no	no	no
Estonia	√	√	√	√	√	no	no	√	no	no	√	√	no	no	no
Finland	√	√	√	√	√	√	√	√	√	√	√	√	√	√	
France	√	no	no	no	√	no	√	Innov- ation	√	Reg- istry	Jou- rnal s	√	no	no	
Germany	√	no	√	no	no	no	√	√	√	√	no				
Greece	√				√	no	√				no				
Hungary	√	√	√	√	√	no	√	√	√	√	poor	√	no	no	√*
Ireland	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Italy	√	no	no	no	√	no	√	√	no	√	no	√	no	no	√
Latvia	√	√	√	√	√	√	√	√	no	√	no	√	√	√	
Lithuania	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Poland	√	√	√	√	√	√	√	√	√	√	√	√	no	no	
Portugal	√	√	√	√	√	no	√	no	√	no	√	√	no	√	
Romania	√		√			no									
Russia	√	√	no	√	√	no	√	no	no	no	no	√	no	no	√
Slovak Rep.	√	√	√	√	√	√	√	√	√	√	- ¹	√	√	-	- ²
Slovenia	√	√	√	√	√	√	√	√	√	√	√	√	√	no	
Spain	√	√	√	(√)	√	√	√	√	√	√	√	√	√	√	√
Turkey	√	√	√	-	-	√	√	√	-	√	√	√	-	√	
UK	√	√	(√)	√	√	(√)	√	√	√	√	√	√	(√)	√	√*
Partner Org. USA															
Partner Org. Japan	√	√	no	√	√	Soon	√	√	no	√	√	√	no	no	

Table of publications offered to members

COUNTRY	Daily Weekly News	Magazine	Journal	National News-letter	Internat. News-letter	Hand-books	Stand-ards	Other Publicitns	Codes of Practice
Croatia	-	-	P	-	-	P	-	-	-
Cyprus		P						Site diary	
Czech Republic		3	3	-	-	P	P	P	P
Estonia		P				P	P	P	
Finland	P + E	P	P	E	no	P	P	P	P + E
France	No	No	No	No	No	No	No	Annual Survey, Flash Info'	
Germany	No	Yes	Yes	No	No	No	No	No	No
Greece	Yes	Yes						Web	
Hungary	-	Yes* 'Mémök Ujság' monthly	-	-	-	Occasio-nally-	-	-	Occasio-nally-
Ireland	Yes, 2 per month	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Italy		Yes			Yes				Yes
Latvia		Yes,P	Yes,P	Yes,P			Yes,P	yes	
Lithuania	-	Yes	-	Yes	-	Yes	Yes	Yes	-
Poland	No	(P+E)	P+E	P+E	No	P+E	No		P+E
Portugal	no	Yes(P)	Yes(P)	no	no	no	no	no	no
Romania									
Russia	no	Yes (p)	Yes (p)	no	no	no	Yes	Yes (p)	no
Slovak Republic	E on the web site	P Projekt - Stavba	-	P Inžiniersk e informácie	-	P	-	P Flash Info'	P
Slovenia	E	-	P	-	-	P+E	P	P	-
Spain	no	monthly	Yes 3	yes	no	yes	yes	yes	yes
Turkey	P (Teknik Güç / Technique)	P (TMH Turkish Engineering News)	P Branch Journals	P Techni-cal News	P Digest	+	-	P	_*
United Kingdom	P	P	P E	E	P E	P	P E	P E	P
Partner Org. USA									
Partner Org. Japan	No	Yes	Yes (With fee)	No	Yes (quarterly)	Yes (purchasa ble)	Yes (purchasable)	Yes (purchasa ble)	Yes

* when codes imply standards, they are covered by law & regulations

KEY – see overleaf

KEY:

P = Printed Matter

E = Electronically available (via web or e-mail)

Daily/Weekly News

A daily and/or weekly newspaper is produced for members

Mag

A magazine is made available to members (e.g. weekly or monthly)

Journal

A Journal is produced (differentiated from Magazine definition by greater emphasis on learned society activity)

Natl Newsl

A National Newsletter is produced

Int Newsl

An International Newsletter is produced

Handbooks

Handbooks on key topics are produced for members

Standards

Organisation is involved in the publication of standards for profession

Other Publicatns

Other publications

Codes of Practice

Chapter 16 - CHANGING WORKING PRACTICES

Questions: *What is your opinion of Eurocodes and how do you believe they will affect the construction sector in your country? In particular, what do accession states feel about harmonisation of codes?
How are Environmental Impact Assessments handled in your country?
Do you believe that enough is being done to implement Information and Communications Technology (ICT) in your country? Is the use of ICT increasing?*

COUNTRY	<i>Eurocodes, Harmonisation</i>	<i>Environmental Impact Assessment</i>	<i>Information and Communication Technology (ICT)</i>
Croatia	Directive 89/106/EEC implemented Eurocodes ENV translated and part of civil engineering education	Improvement by "Strategy for the 21 st Century"	PC use in design, in office, traffic regulation No integration in full construction process
Cyprus	Eurocodes harmonise the use of different standards	Installation of a joint committee	High promotion of a lot of special software packages No total integration
Czech Republic	Positive influence	New Czech Law of environment protection	High effort to increase its use
Estonia	Estonian Standardisation Centre implements Eurocodes and EN	Environmental policy of EU is part of national policy	Very significant increase
Finland	Eurocodes are gradually being adopted and mostly have a positive influence.	Methods and technology for environmental effectiveness are well known	Large research programmes (VERA, SARA, ProIT) promote integrated use of ICT in construction. Use of product model is increasing.
France	Standards are well known and becoming popular	Impact assessment studies are of current practice	Sophisticated software packages are in use, even GPS data are integrated. But sophisticated general systems are still at the stage of research
Germany	Eurocodes are normal working tools but do not replace the German DIN everywhere	Environmental impact assessments are part of each (bigger) construction project at the earliest and public stage	Use of soft-ware packages are normal. Integrated programmes are still missing; each company works on its own development
Greece			
Hungary	Eurocodes part of education, but not famous in the "elder" generation	Regulations are on EU level, application is financially restricted	Frequent use of PC in design and in kind of office works.
Ireland	Harmonisation is a good idea, but government gives not enough direction	Essential parts for major developments	Installation of ICT division within association to promote development

Italy	Eurocodes are used increasingly	Relevant for any important work in particular to infrastructure	Increasing significantly both for mail and design purposes
Latvia	Latvian standardisation committee implements Eurocodes and EN	Part of environmental strategy in Latvia	Significantly increasing
Lithuania	Implementation of harmonised standards is of main priority	Part of environmental strategy in Lithuania	Significantly increasing
Poland	Very positive influence	Part of Polish environment strategy	Use is increasing, but much has to be done
Portugal	Eurocodes are mainly used as reference text due to their complexity	Part of Portuguese strategy	Software packages in use, e-procurement and e-business begins its implementation in construction
Romania	Harmonisation is seen as being very necessary, but needing more time for adaption	Part of Romanian strategy and necessary to be used in major projects	It increases, but is not very much used
Russia	Harmonisation is seen as being very necessary, but needing more time for adaption	Part of Russian strategy and necessary to be used in major projects	It increases, but is not very much used
Slovak Republic	European harmonisation in the construction sector is a big step forward but needs strong involvement	Environmental impact assessment (EIA) is part of the Slovak policy and legislation (Act. No. 127/1994 on EIA amended by the Act no. 391/2000 Coll.)	Currently increasing
Slovenia			
Spain	Excellent opinion transposed into Spanish legislation	Of current practice. EU legislation transposed into Spanish law	Increasing use in construction business in Spain
Turkey	Due to the EU accession process the Eurocodes are becoming more and more interest both in education and usage	Part of the Turkish policy	Is used in a great amount, but a number of problems arise from the employers
United Kingdom	ICE take an active approach to assist its members, website (http://www.eurocodes.co.uk/)	Part of British policy and is undertaken for many individual projects (dams, motorways, airports, etc.)	Increasing use in UK construction business. ICE promotes best practice in IT management systems

Chapter 17 - MEMBERSHIP STRUCTURE AND NUMBERS

- Questions:
- Grades of membership (e. g. fellow, ordinary, student, retired)
 - Total number of members (for multi-disciplinary organisations, the total number of civil engineers is expressed in brackets)

COUNTRY	Grades of membership	Number of members (Period 2003-4)
Croatia	Ordinary	3,100
Cyprus	There is no grade.	1,600
Czech Republic	Institute Chamber	2,500> 21,000
Estonia	FOSR	342 (+2)
Finland	Ordinary Student Retired Total	3,500 1,000 500 5,000
France	Individuals	160,000
Germany	Ordinary	3,500
Greece		
Hungary	1. Candidates and members without licence 2. Member 3. Member with professional licence (planning and expertise is bound by law to the licence granted by the Chamber)	17,380 engineer members, including 5,590 civil engineers
Ireland	There are 7 grades of membership from student to fellow, the most senior grade	22,000
Italy		
Latvia	Ordinary members Associated members Students	626 37 23
Lithuania	Ordinary	900
Poland	Polish Association of Civil Engineers and Technicians: Ordinary Student Retired All 6 associations acting in the range of civil engineering: Polish Chamber of Civil Engineers: Ordinary	6,000 600 1,500 15,000 102,000

Portugal	Student Training Engineer Senior Consulting	13,000
Romania	The Union of Associations of Civil Engineers of Romania - UAICR is composed of 11 professional associations with a cumulated membership of over 6,000.	Individual members of various associations pay modest fees to the respective association. In turn, each association gives a certain percentage to UAICR.
Russia	Ordinary	400 in Moscow in Moscow Region, 2,900 all around Russia
Slovak Republic	Authorised engineer (compulsory membership) Voluntary member - natural person (building site managers, building invigilation officers, students, retired) Voluntary member - legal person Visiting member (from countries other than Slovakia – authorised civil engineers, building site managers and building invigilation officers, etc.)	4,456 281 59 433
Slovenia		
Spain	No distinctions, all members are ordinary	19,000 members
Turkey	Ordinary, student, retired	64,077 (at 15.04.2005)
United Kingdom	Fellow Member Associate member Technician member Graduate Student (on non-accredited courses)	6,024 41,025 3,288 542 14,343 6251

ECCE's Partner Organisations**American Society of Civil Engineers (ASCE), and
Japan Society of Civil Engineers (JSCE)**

COUNTRY	Grades of membership	Number of members (Period 2003-4)
USA	-	-
Japan	Individual	36,000

ANNEXES:

Addendum 1 to Chapter 1 - Education
THE IMPACT OF THE BOLOGNA PROCESS
ON THE CIVIL ENGINEERING EDUCATION
AND PROFESSION IN EUROPE

Author: Prof. Iacint Manoliu Eng PhD

Addendum 2 Universities
with Civil Engineering Curricula

Addendum 3 Supplementary Information
offered by some of our members

ADDENDUM 1 - TO CHAPTER 1 - EDUCATION

THE IMPACT OF THE BOLOGNA PROCESS ON THE CIVIL ENGINEERING EDUCATION AND PROFESSION IN EUROPE⁷

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Co-ordinator of SOCRATES network EUCEET

1. Basic systems of civil engineering education in Europe and main providers

The civil engineering education of Europe is characterized at present by the existence of two basic systems:

- the continental system
- the anglo-saxon or two-tier system

The *continental system* is defined by two programmes put, in most cases, in parallel

- of long duration (4.5 – 5 - 6 years);
- of short duration (3- 3.5 - 4 years).

A variant within the continental system is the "tree" or "y" system, in which the two programmes have a common trunk of 1-2 years.

In the *anglo-saxon system*, the programmes are put in a "ladder". The first step is of 3-4 years' duration. This leads to a Bachelor of Engineering or Bachelor of Science degree or a Master of Engineering (MEng) degree (only when of 4 years' duration). In Ireland, most civil engineering degrees are of 4-years' duration (BEng/ BE /BAI), although there are some 5-years degree courses that build on a Diploma after 3 years. In Scotland, the BEng degree requires 4 years.

As for the higher education institutions providing civil engineering education in Europe, according to the terminology commonly accepted at the level of the European Commission, they belong to two distinct sectors:

- *university sector*
- *non-university sector*

In the *university sector* are found *Universities*, *Technical Universities* and (only in France) *Grandes Ecoles*.

There is a much larger diversity of institutions in the *non-university sector*, such as: *Fachhochschulen* (Austria, Germany), *Hogeschole*n (Netherlands, Belgium-Flanders), *Instituts Superieur Industriels* (Belgium-Wallonia), *Engineering Colleges* (Denmark), *Polytechnics* (Finland), *Technological Education Institutes* - TEI (Greece), *Technical Colleges* (Hungary, Ireland), *Polytechnic Institutes* (Portugal), *University Colleges* (Norway, Romania, Sweden), *Polytechnic Schools* (Spain) etc.

All Higher Education Institutions belonging to the *non-university sector* were aimed, in the pre-Bologna phase, to provide short duration, professionally oriented programmes of 3-3.5 or max 4 years duration.

2. The Bologna process - a chronology

2.1 Sorbonne, May 25th, 1998

In fact, the Bologna process was triggered one year before Bologna. In Paris on the occasion of the 800th anniversary of the Sorbonne on 25th May 1998, Ministers of Education of France, Italy, the United Kingdom and Germany signed the "*Sorbonne Declaration in harmonization of the architecture of the European higher education system*". The *Sorbonne Declaration* stated that a two-cycle system "*seems to emerge*" and "*should be recognised for international comparison and equivalence*". It also mentioned the need to have first cycle degrees which are "*internationally recognised*", as "*an appropriate level of qualification*" and a graduate cycle with "*a shorter master's degree and a longer doctor's degree*", with possibilities to transfer from one to the other.

One can consider, without any doubt, that the basic requirement of the Bologna process, *the adoption of a system based on two main cycles, undergraduate and graduate*, had its roots in the Sorbonne Declaration.

2.2 Bologna, June 19th, 1999

"*The Bologna Declaration on the European Higher Education Area*" was signed by Ministers of Education from 29 countries (15 EU countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom; 2 EEA countries: Iceland, Norway; 11 accession and candidate countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, Malta and Switzerland. In it six main action lines were defined:

1. *Adoption of a system of easily readable and comparable degrees*
2. *Adoption of a system essentially based on two cycles*
3. *Establishment of a system of credits*
4. *Promotion of mobility*
5. *Promotion of European co-operation in quality assurance*
6. *Promotion of the European dimension in higher education*

2.3 Prague, May 19th, 2001

The Communiqué of the Conference of Ministers of Higher Education in Prague "*Towards the European Higher Education Area*" has 33 signatory countries (29 Bologna signatory countries, plus Cyprus, Turkey, Liechtenstein, Croatia).

To the 6 action lines from Bologna, 3 further action lines were added:

7. *Lifelong learning*
8. *Higher education institutions and students*
9. *Promoting the attractiveness of the European Higher Education Area*

2.4 Berlin, September 19th, 2003

The number of signatory countries of the Communiqué "*Realising the European Higher Education Area*" reached 40 (33 Prague signatory countries, plus four Tempus-Cards-Albania, Bosnia-Herzegovina, FYR Macedonia, Serbia-Montenegro, one Tempus Tacis - the Russian Federation; and Andorra and The Holy See).

To the 9 Bologna and Prague action lines, one more was added:

10. *Doctoral level (third cycle) included in the Bologna process*

Other important ideas in the Berlin document:

- *commitment to having started the implementation of the two cycle system by 2005*
- *commitment for the design of an "Overarching Qualification Framework" for the European Higher Education Area.*

2.5 Next step: Bergen, 2005

It is anticipated that the Bologna process will expand further to the East. At the conclusion of the Conference in Bergen in the summer of 2005, it should include as potential signatories, six countries participating in Tempus Tacis, which are party to the European Cultural Convention: Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine. In addition, two small European countries are expected to be represented at the 2005 Conference of European Minister of Education: Monaco and San Marino, increasing the number of signatory countries from 40 to 48.

2.6 Not only Conferences of Ministers of Education

The Bologna process does not mean only the Conferences of Minister of Education, convened every two years since June 1999, no matter how substantial and rich in consequences the Declarations or Communiqués they produce. It also involves a long chain of meetings, seminars, workshops, in which various stakeholders are engaged. The most notable events, undoubtedly, were the *Conventions of the European Higher Education Institutions* organised by the *European Universities Associations - EUA*. The first EUA Convention took place in Salamanca in March 2001, in preparation for the Prague Conference, the second one in Graz, in May 2003, in preparation for the Berlin Conference, the third one will be hosted in 2005 by Glasgow, in preparation for the Bergen Conference.

3. The Bologna process

3.1 The BA-MA-DO structures or the full implementation of the Bologna action lines 2 and 10

The three tiers (cycles, levels) which result from combining action lines two and 10 of the Bologna process, lead to what is now recognised across Europe as BA-MA-DO structure, shown in fig. 1.

One academic year corresponds to 60 ECTS credits, a Bachelor degree requires 3 to 4 years and a Master degree 1 to 2 years. As for the doctoral studies, having as their main objective the elaboration and defence of a doctoral thesis, they require usually 3 to 4 years (full time work) and are not always credit-rated.

3.2 First, second and third cycle degrees in engineering education

The meaning of a doctor's degree is quite straightforward. Instead, there is no general use of the terms Bachelor and Master, even when the two-tier system is introduced. It is, therefore, more realistic to speak in terms of degrees: first cycle, second cycle and third cycle degree.

Since the implementation over all Europe of a BA-MA-DO structure in engineering education is a rather long term objective is better to use the scheme in fig.1, where, in fact, the continental system (fig. 1) and the two-tier system (fig. 2) were put together. The long one-tier study programmes of 5 years are named "integrated" programmes, leading straight to a Master-level degree.

3.3 The Bologna process and the continental system of engineering education

As far as engineering education is concerned, it is obvious that the continental system is the one to be affected by the Bologna process. As illustrated on p.1, the system comprises long duration programmes, more scientifically oriented, and short duration programme, more application or vocationally oriented.

Both types of programmes must change when a two-tier system is adopted. Different ways in which such changes occurred or possibly will occur and their implications will be discussed in Section 5.

4. The Bologna process - the position of the academic world

4.1 Three recommendations of CESAER and SEFI

In February 2003, CESAER (The Conference of European Schools for Advanced Engineering Education and Research) and SEFI (The European Society for Engineering Education), jointly organised a seminar at Helsinki University of Technology. This concluded with "*Communication of CESAER and SEFI on the Bologna Declaration*".

In this Communication, they made eight recommendations. The first three are the most relevant for our discussion:

- 1. The special role and features of engineering must be taken into account in the Bologna Process.*
- 2. In the scientifically oriented programmes the students should normally be educated to the level of the second degree. There must continue to be provision for an integrated route to second cycle Master level.*
- 3. The specific qualities of the presently existing application oriented first cycle degree must be recognised and safe-guarded, with bridges to second cycle programmes being provided.*

4.2 EUCEET position on the implementation of the Bologna Declaration in civil engineering education

EUCEET (European Civil Engineering Education and Training) is a Thematic Network initiated by the Technical University of Civil Engineering of Bucharest and coordinated by the Ecole Nationale des Ponts et Chaussées Paris.

EUCEET was granted a 3-year contract (1 September 1998 - 31 August 2001) within the third round of applications for Thematic Networks under the SOCRATES programme.

On September 2001, the European Commission approved the one-year extension of EUCEET for dissemination purposes (1st October 2001 - 30th September 2002).

On 24th July 2002, Ecole Nationale des Ponts et Chaussées Paris, coordinator of the EUCEET Thematic Network Project, was notified by the European Commission that the application for a new EUCEET II project had been approved.

In 2003/ 2004, which is the second year of EUCEET II, the Thematic Network Project numbered 137 partners from 33 countries.

When the EUCEET II Management Committee (MC) met in Ciudad Real on 19th September 2003 for the first time the proposal was made to adopt a position statement on the implementation of the Bologna Declaration in civil engineering education. In the months following the meeting, the general lines of such a statement were defined and a draft was circulated among the MC members.

At the next Management Committee meeting, held in Paris on 16th February 2004, the following statement was adopted with clear majority:

"EUCEET is supporting and encouraging the application of the idea of two-tier education system in Civil Engineering as suggested in Bologna Declaration.

The adoption of a system based on two main cycles, whenever takes place, must take into consideration the specificity of the civil engineering education and profession. Civil engineers perform and provide services to the community with significant implications for public safety and health. As a consequence, the first cycle in civil engineering education shall be relevant to the labor market and shall ensure graduates with a level of competences tuned to the substantial responsibilities of the profession. A duration of 4 years (or the equivalent of 240 ECTS credits) seems to fit that purpose.

A 4-year duration of the first cycle in civil engineering education is aimed also at facilitating transnational recognition of degrees and professional mobility of European civil engineers. In

this respect, due consideration had to be given to the fact that various alliances between engineering organisations, such as Washington Accord and the Engineers Mobility Forum have established that the required academic component of the qualification of a professional engineer should be 4 or 5 years full time study in University.

The existing integrated 5-year curricula in civil engineering, leading straight to a Master's degree, is also compatible with the letter and spirit of the Bologna Declaration and with the vision of a European Higher Education Area."

4.3 A clear rejection of Bologna action line 2 coming from Greece

In the opening session of the First General Assembly of EUCEET II, on 20th February 2003, the then Rector of the National Technical University of Athens, Prof. Themistocles Xanthopoulos, gave a talk on "*Market Globalization, European University Education and the Bologna Declaration: Background Policy Analysis, Positions and Proposals*" [6] in which the position in Greece regarding the Bologna Declaration was clearly expressed. Here are some opinions regarding the action line 2:

"Any splitting of the existing structure into two cycles, the undergraduate and the postgraduate, de facto downgrades the undergraduate cycle to that of the Schools of Higher Professional or Vocational Training, given that it is not possible to equip with substantial professional skills in the short period of this cycle without at the same time the shrinkage of the background scientific knowledge, that is without the actual betrayal of the scientific substance of the University degree.

It is, besides, at least unreasonable to claim that it is possible to decrease the duration of studies without downgrading their university nature, at a time of pressing demands, both from students and academic staff, for an increase of the duration of university studies due to the explosive increase of knowledge in the applied sciences and technology, as well as the recognition by the relevant professional bodies of the inadequacies of the Bachelor's degree, as a university diploma, in the labour market.

We reject explicitly the main objective of the Bologna Declaration, namely the compulsory and universal division of all University courses into two cycles ..."

5. Civil engineering education in Europe in 2003 - 2004, four years after Bologna

Some comments are necessary on the changes brought by the implementation of the action line 2 of the Bologna Declaration. Before proceeding it is, however, worth recalling the full extent of action line 2:

"Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens employability and the international competitiveness of the European higher education system. Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a maximum of three years. The degree awarded after the first cycle shall be relevant to the European labour market as an appropriate level of qualification. The second cycle should lead to the master and/ or doctorate degrees as in many European countries".

Table 1 presents the evolution of degree structures at university or 'university-like' institutions providing civil engineering education. A clear trend, from one-tier to two-tier, can be observed in the degree structures at universities. Since 1999-2000, the integrated, one-tier programmes leading straight to a degree equivalent to a Master degree, have been already

replaced by two-tier programmes in the Czech Republic, Netherlands and Slovakia, but a similar move is expected in the near future in many other countries.

Table 1
Degree structures at universities

Country	1999 / 2000		2003 / 2004		foreseen for 2005 and beyond	
	One-tier	Two-tier	One-tier	Two-tier	One-tier	Two-tier
AT Austria	X		X			X
BE Belgium	X		X			X
BE Wall Belgium	X		X			X
BG Bulgaria	X		X ¹	X	X ¹	X
CZ Czech Republic	X			X		X
DE Germany	X		X		X ²	X
DK Denmark	X		X			X
EE Estonia		X		X		X
ES Spain	X		X			X
FI Finland	X		X			X
FR France	X		X		X	
GR Greece	X		X		X	
HU Hungary	X		X			X
IE Ireland		X		X		X
IT Italy	X			X		X
LT Lithuania		X		X		X
LV Latvia		X		X		X
NL Netherlands	X			X		X
NO Norway	X				X ³	X
PL Poland	X		X		X ⁴	X ⁴
PT Portugal	X		X		X ⁵	X
RO Romania	X		X			X
RU Russia	X		X			X
SE Sweden	X					X
SI Slovenia	X		X			X
SK Slovakia	X			X		X
TK Turkey		X		X		X
UK United Kingdom	X			X		X

¹ Only at the University of Architecture, Civil Engineering and Geodesy, Sofia

² At certain Technical Universities

³ Only at the Norwegian University of Science and Technology, Trondheim

⁴ At certain Technical Universities

⁵ At certain Universities

5.1 Shift from the integrated programmes to the two-tier programmes

5.1.1 The 3+2 formula

Table 2 presents a synthesis of the formulas adopted (or to be adopted) when the change from the one-tier to two-tier programmes in the degree structures of the universities is made.

As one can observe, the solution preferred in most cases is to split the existing 5-year programme by introducing a Bachelor degree after the first 3 years.

One immediate question to be raised is in which way the newly created 3-year degree will fulfil the Bologna requirement of being "*relevant to the European labour market as an appropriate level of qualification*".

It appears that in almost all cases when the formula 3+2 is adopted, the new Bachelor's degree is considered primarily as a **break** or **pivot** point, suitable for mobility and to a lesser extent for employability.

On the other hand, there seems to be an implicit assumption that all or almost all of the students getting the diploma delivered after 3 years will continue studies at the same university, until the 3+2 programme is completed, in which case the matter of employability is of no relevance.

5.1.2 The 4+... formulas

A different approach consists in building a Bachelor's degree being in itself "*relevant to the European labour market*", as required by Bologna.

In Latvia and Lithuania, a 4-year duration for the first cycle degree and a 2-year duration for the second cycle were adopted long before the Bologna process started.

In the Czech Republic, both the short duration programmes of 3-4 years and the long duration programmes of 5-5.5 year ceased to be offered from academic year 2003-2004, being replaced by a two-tier programme of 4+1.5 years.

In Romania, a 4+1.5 programme will be introduced starting in 2005-2006.

A preference for a 4 year duration for the first cycle in the university sector was also expressed in Hungary, Spain and Portugal.

Not only by duration, but also by the balance between the academic content and the skills orientation, the 4-years programmes offer to the graduates an option to enter the labour market. As a consequence, only a part of the graduates of the first cycle are expected to enrol for the second cycle.

One should mention, however, that 4+1.5 or 4+2 formulas are possible only when, by law or by other means, the cumulated duration of the first two cycles is not limited to 5 years.

5.2 Not one, but a diversity of "Bachelor's" as a first cycle degree

Implementation of the Bologna action line 2 in the university sector and in the non-university sector as well, leads unavoidably to a diversity of first cycle degrees, whether or not they are named as Bachelor's degrees.

Several such degrees were already referred to in some of the previous paragraphs.

- the more or less purely "*academic Bachelor*", in the 3+2 structure adopted by research universities, serving mainly as a "*stepping-stone*"
- the Bachelor "*being in itself relevant to the European labour market*" in the 4+... structures

Table 2
Shift from the INTEGRATED programmes to the TWO-TIER programmes

Country	Formula adopted (or to be adopted)						New Bachelor's degree	
	3 + 1.5	3+2	3.5 + 1.5	4 + 1	4 + 1.5	4 + 2	being in itself "relevant to the European labour market"	primarily a break or pivot points suitable for mobility
BE Belgium		X						X
DK Denmark		X						X
DE Germany (TU)		X						X
FI Finland		X						X
NL Netherlands		X						X
SE Sweden	X							X
IT Italy		X						X
CZ Czech Republic					X	X ¹	X	
LI Lithuania						X		
LV Latvia						X	X	
			X ²				X	
PL Poland				X ²			X	
					X ²		X	
RO Romania					X		X	
SK Slovakia		X						X

¹ Only for the specialisation "Buildings and Architecture" at CTU Prague

² At certain Technical Universities (TU)

In addition to these “*new Bachelors*”, appearing as a result of the splitting of the integrated programmes, there are many others offered by the non-university sector, having a well established tradition and programmes recognised by the profession. In Denmark, for instance, a Bachelor degree after 3.5 years offered both in the non-university sector (at University Colleges) and in the university sector, is accepted for professional recognition by the Society of Danish Engineers. This is not yet case for the 3-year Bachelor in the 3+2 scheme introduced after Bologna by the universities.

Similar comparisons between existing Bachelor or Bachelor-type degrees, offered by the non-university sector and the new Bachelors created in the university sector, can be made in all countries where the two-tier programme of 3+2 is replacing the one-tier, 5-year programme, such as Netherlands, Belgium, Finland etc.

But even in a country such as England where, since the transformation of Polytechnics in Universities, the higher education system ceased to be binary and became a unitary one, there is a marked diversity of Bachelor programmes of equal duration (3 years), due to the inherent and great differences in the institutions providing the degree courses.

The conclusion is that one cannot speak about a “*First cycle degree*”, be it called Bachelor or whatever, in general, but only in the context of a given educational structure.

For the time being it can be stated that the large majority of bachelor degree course offered by higher engineering education institutions in Europe, both in the university sector and in the non-university sector, can be recognised as belonging to one of the following two categories:

- professional bachelor, more application oriented
- academic bachelor, more theoretical oriented

5.3 At Master's level, the picture is more complex

In first place, there are Master's or equivalent degrees provided in the continental system as the result of 5-year integrated programmes of a 2+3 programme at the Grandes Ecoles in France. They can be named “*Integrated Masters*”.

There are, of course, existing Master degrees offered in countries with centuries old traditions in the anglo-saxon system (UK, Ireland) or in countries in which the system was introduced in the early 90's (Baltic countries). They can be named “*Consecutive Masters*”. Belonging to the same category are the Masters resulting from the process of splitting the integrated programmes adopting formulas such as 3 + 2; 3.5 + 1.5; 4 + 1.5 or 4 + 2.

As for the *nature* of these Master's degrees, they can be *Research Masters* or *Professional Masters* in one specific field, but also “*Conversion Masters*” embracing two distinct fields, such as engineering + economics, engineering + law etc.

Programmes leading to Master's degrees can be organised in co-operation by several universities. These are “*Joint Masters*”. A recent development in that direction, is the “*Erasmus Mundus*” programme launched by the European Commission in December 2003 and whose implementation will start in the academic year 2004-2005. The purpose of the programme is not the creation of new Master courses but to provide support for existing courses to get the label “*Erasmus Mundus Master Course*”. The consortium of institutions to apply for getting funds from the Erasmus Mundus programme should comprise at least 3 higher education institutions from 3 different countries, from which at least two Member States of the European Union. Graduate students participating in the programme, should study at least two H.E. institutions and make use of at least two languages.

5.4 An increasingly blurred line of divide between the university and non-university sector in European engineering education

A visible and significant outcome of the Bologna process developed so far is the fact that the line of divide between the university and non-university system is blurring. In what follows there are a few examples in support of this assertion.

A novelty which the Bologna process is bringing about in civil engineering education is the extension of the Master's degree providers to the non-university sector.

The report on civil engineering education in Norway, mentions the name of two University Colleges which are already providing education at Master level. Very probably a similar pattern will be followed in other countries by institutions belonging to the non-university sector.

In Portugal, as shown in a EUCET report, while the Universities are not yet decided on the way in which to move to the two-tier system, the Polytechnic Institutes were authorised to offer by a 2-year programme, resulting altogether in a "*Licenciatura degree*".

In Germany, even before Bologna, the Education Framework Law introduced in 1998 opened the possibility to both Universities and Fachhochschulen to offer Bachelor and Master degree courses.

6. The reaction of the industry

A process as extensive and complex as the Bologna process should interest other stakeholders besides academics. For instance, the civil engineering and construction industry.

A first observation to make is that in most countries there is no a framework for a proper consultation and participation from industry regarding changes in higher education.

Under such circumstances, it was hard to expect an industry reaction. On the other hand, where changes have occurred so far, too little time has passed since these changes, to enable the industry to make a judgment.

Scepticism seems to be the word to best characterize the reaction of the industry towards the extension of the cycles system in engineering education in Europe. And a "*wait and see*" attitude, until the cohorts of graduates of the new programmes join the industry.

7. The reaction of the professional associations

Professional associations which are involved in the professional recognition of engineering graduates have strong reasons to watch the Bologna process.

In only a few countries, however, has a public and official stance been taken. One such exception is the Institution of Engineers of Ireland (IEI) which in November 2003 launched a proposal called: entitled "*A New Structure for Engineering Education in Ireland - Implementation of the Bologna Declaration*". A five-year integrated Master degree is proposed, with a Bachelor degree (of "pivot" type) at the end of year three. Another proposal is for a three-year engineering technology degree to run in parallel, with the possibility of transfer from an engineering technology bachelor degree to year four of an engineering master degree only on completion of bridging studies including mathematics. As one can recognise, the IEI's vision in implementing the Bologna Declaration means a move from the anglo-saxon system to the continental system, with programmes put in parallel.

In Italy, the Italian Engineering Board (Consiglio degli Ingegneri) was never in favour of a 3-year first-level degree. However, a law allows holders of such a title to apply for recognition as professionals.

In countries where new Bachelor's degrees are created by splitting the integrated 5-year programmes (3+2 formula) professional associations seem to have a real concern regarding

the length of the first professional degree. The prevailing opinion is that the first professional degree can only be the Master's degree.

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ADDENDUM 2

UNIVERSITIES WITH CIVIL ENGINEERING CURRICULA

Croatia

4 of 6 Universities:
University of Zagreb
University of Split
University of Rijeka
University of Osijek

Cyprus

University of Cyprus

Czech Republic

CVUT Praha
Technical University of Brno
Technical University of Ostrava

Estonia

Tallinn Technical University
Estonian Agricultural University (Tartu)
Tallin College of Engineering

Finland

Universities with education in civil engineering:
Technical University of Helsinki
Technical University of Tampere

Universities with education in Environmental and energy engineering:
Technical university of Oulu
Technical university of Lappeenranta

17 Technical Polytechnics around Finland provide a BSc degree in civil engineering.

France

“Grandes Ecoles”

- Ecole Nationale des Ponts et Chaussées. (ENPC). Paris
- Ecole Nationale des Travaux Publics de l'Etat (ENTPE). Lyon
- Ecole Nationale Supérieure de Géologie (ENSG). Nancy
- Ecole Centrale de Paris
- Ecole Centrale de Nantes
- Ecole des Mines de Paris
- Ecole des Mines de Douai
- Ecole des Mines de Nancy
- Ecole Normale Supérieure de Cachan (ENS)
- Ecole Supérieure des Travaux Publics et du Bâtiment (ESTP) Paris
- Institut Supérieur du béton armé (ISBA) Marseille

Instituts Supérieurs des Sciences Appliquées

- INSA de Lyon.
- INSA de Rennes.
- INSA de Strasbourg
- INSA de Toulouse.

Universities

- Université de Lille/Artois. Institut Universitaire de Technologie (IUT)
- Université de Bordeaux 1. Institut Universitaire de Technologie (IUT)
- Université de Clermont-Ferrand. Centre Universitaire des Sciences et Technologie (CUST)
- Université Joseph Fournier (Grenoble). Institut Polytechnique de Grenoble
- Université de Grenoble. Polytech'Grenoble. Ecole d'ingénieurs de l'Université de Grenoble
- Université de Lille. Polytech'Lille. Ecole d'Ingénieurs de l'Université de Lille
- Université de Limoges. Institut Universitaire de Technologie (IUT). Egletons
- Université de Lyon I. Institut Universitaire de Technologie (IUT)
- Université de Marne la Vallée
- Université de Montpellier/ Nîmes. Institut Universitaire de Technologie (IUT)
- Université de Nancy/ Nancy-Brabois. Institut Universitaire de Technologie (IUT)
- Université de Nantes/Saint-Nazaire. Institut Universitaire de Technologie (IUT)
- Université de Nantes/Bretagne-Sud. Institut Universitaire Professionnel Lorient
- Université d'Orléans
- Université de Poitiers/La Rochelle. Institut Universitaire de Technologie (IUT)
- Université de Pau et des Pays de l'Adour. Institut Universitaire de Technologie (IUT).Anglet
- Université de Rennes/Bretagne-Sud. Institut Universitaire Professionnel Lorient
- Université de Rennes. Institut Universitaire de Technologie (IUT)
- Université de Rouen/Le Havre. Institut Universitaire de Technologie (IUT)
- Université de Savoie
- Université de Toulouse
- Université de Versailles.Cergy-Pontoise. Institut Universitaire de Technologie (IUT)
- Université de Versailles/Cergy-Pontoise. Institut Universitaire Professionnel

Germany

Universities, Technical Universities, and Comprehensive Universities

Aachen: Fakultät fuer Bauingenieur- und Vermessungswesen [RWTH Aachen]
Berlin: Bauingenieurwesen [TU Berlin]
Bochum: Ruhr-Universität Bochum - Fakultät für Bauwesen
Braunschweig: Fachbereich 6 - Bauingenieur- und Vermessungswesen [TU Braunschweig]
Cottbus: Fakultät 2 Architektur und Bauingenieurwesen [TU Cottbus]
Darmstadt: THD Fachbereich Bauingenieurwesen [TH Darmstadt]
Dortmund: Fakultät Bauwesen, Universität Dortmund [Uni Dortmund]
Dresden: Fakultät Bauingenieurwesen
Essen: [10]: Bauwesen [Uni GH Essen]
Hamburg-Harburg: Bauingenieurwesen und Umwelttechnik [TU Hamburg-Harburg]
Hannover: Fachrichtung Bauingenieurwesen [Uni Hannover]
Kaiserslautern: Bauingenieurwesen (deutsche Homepage) [Uni Kaiserslautern]
Karlsruhe: Fakultät für Bauingenieur- und Vermessungswesen [Universität Karlsruhe]
Kassel: FB14: Bauingenieurwesen [Uni GH Kassel]
Leipzig: Bauingenieurwesen Leipzig [Uni Leipzig]
München (BW): Fakultät für Bauingenieur- und Vermessungswesen [Bundeswehr-Hochschule]
München (TU): Fakultät für Bauingenieur- und Vermessungswesen [TU München]
Rostock: Universität Rostock, Fachbereich Bauingenieurwesen [Uni Rostock]
Siegen: Fachbereich 10 - Bauingenieurwesen [Uni Siegen]
Stuttgart: Bauingenieurwesen [Uni Stuttgart]
Weimar: Bauingenieurwesen/Civil Engineering [HAB Weimar]
Wuppertal: Homepage FB 11 - Bauingenieurwesen

Universities of Applied Sciences

Aachen (FH): Fachbereich Bauingenieurwesen [FH Aachen]
Augsburg (FH): Bauingenieurwesen
Berlin (FHTW): Bauingenieurwesen
Berlin (TFH): Bauingenieurwesen
Biberach (FH): Bauingenieurwesen
Bielefeld (FH): Studiengang Bauingenieurwesen
Bochum (FH): Fachhochschule Bochum Fachbereich Bauingenieurwesen
Bremen (FH): Fachhochschule Bremen Fachbereich Bauingenieurwesen
Buxtehude (FH): Fachhochschule Nordostniedersachsen in Buxtehude, FB B
Coburg (FH): Fachhochschule Coburg - Bauingenieurwesen
Cottbus (FH): Fachhochschule Lausitz
Darmstadt (FH): Fachhochschule Darmstadt - Bauingenieurwesen
Dessau (FH): Fachbereich 3
Detmold (FH): FH Lippe (in Detmold) - Fachbereich Bauingenieurwesen
Dresden (HTW): HTW Dresden - Fachbereich Bauingenieurwesen
Erfurt (FH): FH Erfurt - Fachbereich Bauingenieurwesen
Frankfurt am Main (FH): Startseite des Fachbereichs Bauingenieurwesen (02)
Gießen (FH): Fachbereich Bauingenieurwesen
Hamburg (FH): Fachbereiche und Institutionen
Hannover (FH): Fachbereich Bauingenieurwesen
Hildesheim (Holzminden) (FH): Bauingenieurwesen an der Fachhochschule Holzminden
Kaiserslautern (FH): FH-KL Fachbereich Bauingenieurwesen
Karlsruhe (FH): Fachbereich Bauingenieurwesen
Kiel (FH): Fachbereich Bauingenieurwesen
Koblenz (FH): Fachbereich Bauingenieurwesen
Köln (FH): Fachbereich Bauingenieurwesen
Konstanz (FH): Bauingenieurwesen - Index
Leipzig (FH): Bauingenieurwesen

Lübeck (FH): Bauingenieurwesen
Magdeburg (FH): FH Magdeburg FB Bauwesen
Mainz (FH): FH Mainz FB Bauwesen
München (FH): Fachbereich 02 - Bauingenieurwesen, Stahlbau, Titelseite
Münster (FH): Fachhochschule Münster - Fachbereich Bauingenieurwesen
Neubrandenburg (FH): FH-Neubrandenburg, Studiengang Bauingenieurwesen Homepage
Nürnberg (FH): FH-Nürnberg, Fachbereich Bauingenieurwesen Homepage
Oldenburg (FH): Homepage Fachbereich Bauingenieurwesen
Potsdam (FH): <http://www.fh-potsdam.de/~Bauing/>
Regensburg (FH): FH Rgbg - Fachbereich Bauingenieurwesen
Saarbrücken (HTW): HTW Saarbrücken, Bauingenieurwesen
Stuttgart (FH): HfT Bauingenieurwesen
Sudenburg (FH): FH Sudenburg, Bauingenieurwesen
Trier (FH): FB 2 - Bauingenieurwesen
Wiesbaden (FH): Fachbereich Bauingenieurwesen
Wismar (FH): Fachbereich Bauingenieurwesen
Würzburg (FH): StGB
Zittau (FH): Bauingenieurwesen

Hungary

Budapest Technical University (Budapest University of Technology and Economics, Faculty of Civil Engineering)
Győr University (Széchenyi István University (Győr), Faculty of Building and Environmental Engineering)
Pécs JPT Polláck College (Polláck Mihály Faculty of Engineering)

Three years college education:
Ybl Miklós College Budapest
Győr University
Pécs Pollack College
Debrecen University

Ireland

National Universities of Ireland (NUI)
Dublin
Cork
Galway
Trinity College Dublin
Institutes of Technology
Dublin
Waterford
Sligo
Cork

Italy

(40 Italian universities)

Università Politecnica delle MARCHE
Politecnico di BARI
Università degli Studi della BASILICATA
Università degli Studi di BERGAMO
Università degli Studi di BOLOGNA
Università degli Studi di BRESCIA
Università degli Studi di CAGLIARI
Università degli Studi della CALABRIA
Università degli Studi di CASSINO
Università "Carlo Cattaneo" – LIUC
Università degli Studi di CATANIA
Università degli Studi di FERRARA
Università degli Studi di FIRENZE
Università degli Studi di GENOVA
Università degli Studi de L'AQUILA
Università degli Studi di LECCE
Università degli Studi di MESSINA
Politecnico di MILANO
Università degli Studi di MODENA e REGGIO EMILIA
Università degli Studi di NAPOLI "Federico II"
Seconda Università degli Studi di NAPOLI
Università degli Studi di NAPOLI "Parthenope"
Università degli Studi di PADOVA
Università degli Studi di PALERMO
Università degli Studi di PARMA
Università degli Studi di PAVIA
Università degli Studi di PERUGIA
Università di PISA
Università degli Studi "Mediterranea" di REGGIO CALABRIA
Università degli Studi di ROMA "La Sapienza"
Università degli Studi di ROMA "Tor Vergata"
Università degli Studi ROMA TRE
Università "Campus Bio-Medico" ROMA
Università degli Studi di SALERNO
Università degli Studi del SANNIO di BENEVENTO
Università degli Studi di SIENA
Politecnico di TORINO
Università degli Studi di TRENTO
Università degli Studi di TRIESTE
Università degli Studi di UDINE

Latvia

Riga Technical University (RTU) , Faculty of Civil Engineering and Building (include College programme department) (www.bf.rtu.lv), Dean Juris Smirnovs, 16/22 Azenes str., Riga LV1048, Phone +371 7089278, Fax +371 7089235, e-mail: smirnovs@bf.rtu.lv

Latvia University of Agriculture (LUA), Faculty of Rural Engineering (www.llu.lv), Dean: Ritvars Sudars, 19 Akademijas str., Jelgava, LV 3001, Phone +371 3027709, Fax: +3713022180, e-mail: lifdek@cs.llu.lv

Riga College of Building (first higher education level)(www.rck.lv) Director: Ludmila Okulovica,3 Gaizinu str., Riga LV1050, Phone +371 7229714, Fax: +371 7228726, E-mail: sekretare@rck.eunet.lv

Lithuania

There are five higher education institutions in Lithuania, having university study programmes in civil engineering, as listed below:

Vilnius Gediminas Technical University	web site http://www.vtu.lt
Kaunas University of Technology	web site http://www.ktu.lt
Klaipeda University	web site http://www.ku.lt
Lithuanian University of Agriculture	web site http://www.lzua.lt
Siauliai University	web site http://www.su.lt

Non university study programs in civil engineering are possible in:

Vilnius Collage of Construction and design	http://www.vsdk.lt
Technical Collage of Kaunas	http://www.ktk.lt

Poland

There are nineteen universities of technology in Poland, as follows:

1. Białystok University of Technology,	http://www.pb.bialystok.pl
2. Częstochowa University of Technology,	http://www.pcz.pl
3. Gdańsk University of Technology,	http://www.pg.gda.pl
4. Kraków University of Technology,	http://www.pk.edu.pl
5. Lublin University of Technology,	http://www.pollub.pl
6. Rzeszów University of Technology,	http://www.prz.rzeszow.pl
7. Łódź University of Technology,	http://www.p.lodz.pl
8. Poznań University of Technology,	http://www.put.poznan.pl
9. Szczecin University of Technology,	http://www.ps.pl
10. Silesian University of Technology,	http://www.polsl.pl
11. Świętokrzyski University of Technology,	http://www.tu.kielce.pl
12. Warsaw University of Technology,	http://www.pw.edu.pl
13. Wrocław University of Technology,	http://www.pwr.wroc.pl
14. Opole University of Technology,	http://www.po.opole.pl
15. Koszalin University of Technology,	http://www.tu.koszalin.pl
16. Radom University of Technology,	http://www.pr.radom.pl
17. Zielona Góra University,	http://www.uz.zgora.pl
18. Academy of Mining and Metallurgy,	http://www.agh.edu.pl
19. Military University of Technology,	http://www.wat.edu.pl

Portugal

There are eight universities in Portugal which have Civil engineering Courses approved by the Ordem dos Engenheiros. These are:

IST – Lisbon
UNL – Lisbon
ISEL – Lisbon
FEUP – Porto
FCTUC – Coimbra
UM – Guimarães
UBI – Covilhã
UTAD – Vila Real

Romania

1. Technical University of Civil Engineering of Bucharest
2. University “Politehnica” Timisoara
3. Technical University “Gheorhe Asachi” of Iasi
4. Technical University of Cluj-Napoca
5. University “Ovidius” Constanta
6. University “Transilvania” Brasov
7. University Orada
8. University Petrosani

Russia

1. Moscow State University of Civil Engineering^{*)}
2. Belgorod State Technological University named after Shoukhov^{*)}
3. Volgograd State Academy of Architecture and Civil Engineering
4. Voronezh State University of Architecture and Civil Engineering^{*)}
5. Ivanovo State Academy of Architecture and Civil Engineering
6. Kazan State Academy of Architecture and Civil Engineering
7. Krasnojarsk State Academy of Architecture and Civil Engineering
8. Moscow Institute of Municipal Economy and Construction
9. Nizhny Novgorod State University of Architecture and Civil Engineering
10. Novosibirsk State University of Architecture and Civil Engineering^{*)}
11. Penza State Academy of Architecture and Civil Engineering
12. Rostov-on-Don State University of Civil Engineering
13. Samara State Academy of Architecture and Civil Engineering
14. St. Petersburg State University of Architecture and Civil Engineering^{*)}
15. Tomsk State University of Architecture and Civil Engineering^{*)}
16. T'umen State Academy of Architecture and Civil Engineering

^{*)} Marked Universities have courses, accredited by the Joint Board Moderators of the Institution of Civil Engineers (UK) and Institution of Structural Engineers (UK).

Besides more than 100 Technical Universities are providing civil engineering courses.

Slovak Republic

The Slovak University of Technology, The Faculty of Civil Engineering (Bratislava)
University Žilina, The Faculty of Civil Engineering (Žilina)
Technical University of Košice, The Faculty of Civil Engineering (Košice)

Spain

Carrera de Ingeniero de Caminos, Canales y Puertos

Within the Universities, at the 'Escuela Técnica Superior'

Universidad Politécnica de Cataluña

<http://www.upc.es>

Universidad da Coruña

<http://www.udc.es>

Universidad de Burgos

<http://www.ubu.es>

Universidad de Cantabria (Santander)

<http://www.unican.es>

Universidad de Castilla-La Mancha (Ciudad Real)

<http://www.uclm.es>

Universidad de Granada

<http://www.ugr.es>

Universidad Politécnica de Madrid

<http://www.upm.es>

Universidad Politécnica de Valencia

<http://www.upv.es>

Universidad Alfonso X (Private University, located in the outskirts of Madrid in the village of Villanueva de La Cañada)

<http://www.uax.es>

Turkey

Turkey's three leading civil engineering departments are marked in bold print below

1	Abant İzzet Baysal University	Bolu	http://www.ibu.tr/
2	Afyon Kocapete University	Afyon	http://www.aku.tr/
3	Akdeniz University	Antalya	http://www.akdeniz.edu.tr/
4	Anadolu University	Eskişehir	http://www.anadolu.edu.tr/
5	Atatürk University	Erzurum	http://www.atauni.edu.tr/
6	Atılım University	Ankara	http://www.atilim.edu.tr/
7	Balıkesir University	Balıkesir	http://www.balikesir.edu.tr/
8	Boğaziçi University	İstanbul	http://www.boun.edu.tr/
9	Celal Bayar University	Manisa	http://www.bayar.edu.tr/
10	Cumhuriyet University	Sivas	http://www.cumhuriyet.edu.tr/
11	Çukurova University	Adana	http://www.cu.edu.tr/
12	Cyprus International University	KKTC	http://www.ciu.edu.tr/
13	Dicle University	Diyarbakır	http://www.dicle.edu.tr/
14	Dokuz Eylül University	İzmir	http://www.deu.edu.tr/
15	Dumlupınar University	Kütahya	http://www.dumlupinar.edu.tr/
16	Eastern Mediterranean University	KKTC	http://www.emu.edu.tr/
17	Ege University	İzmir	http://www.ege.edu.tr/
18	Erciyes University	Kayseri	http://www.erciyes.edu.tr/
19	Firat University	Elazığ	http://www.firat.edu.tr/
20	Gazi University	Ankara	http://www.gazi.edu.tr/
21	Gaziantep University	Gaziantep	http://www.gantep.edu.tr/
22	Harran University	Şanlıurfa	http://www.harran.edu.tr/
23	İstanbul Kültür University	İstanbul	http://www.iku.edu.tr/
24	İstanbul University	İstanbul	http://www.istanbul.edu.tr/
25	İstanbul Technical University	İstanbul	http://www.itu.edu.tr/
26	Izmir Advanced Technology Institute	İzmir	http://www.iyte.edu.tr/
27	Karadeniz Technical University	Trabzon	http://www.ktu.edu.tr/
28	Kırıkkale University	Kırıkkale	http://www.kku.edu.tr/
29	Kocaeli University	Kocaeli	http://www.kou.edu.tr/
30	European University of Lefke	KKTC	http://www.lefke.edu.tr/
31	Mersin University	Mersin	http://www.mersin.edu.tr/
32	Mustafa Kemal University	Hatay	http://www.mku.edu.tr/
33	Niğde University	Niğde	http://www.nigde.edu.tr/
34	Middle East Technical University	Ankara	http://www.metu.edu.tr/
35	Ondokuzmayıs University	Samsun	http://www.omu.edu.tr/
36	Osmangazi University	Eskişehir	http://www.ogu.edu.tr/
37	Pamukkale University	Denizli	http://www.pamukkale.edu.tr/
38	Sakarya University	Sakarya	http://www.sau.edu.tr/
39	Selçuk University	Konya	http://www.selcuk.edu.tr/
40	Süleyman Demirel University	Isparta	http://www.sdu.edu.tr/
41	Sütcü İmam University	Kahramanmaraş	http://www.ksu.edu.tr/
42	Trakya University	Çorlu	http://www.trakya.edu.tr/
43	Near East University	KKTC	http://www.neu.edu.tr/
44	Yıldız Technical University	İstanbul	http://www.yildiz.edu.tr/
45	Yüzüncü Yil University	Van	http://www.yyu.edu.tr/
46	Zonguldak Karaelmas University	Zonguldak	http://www.karaelmas.edu.tr/

United Kingdom

More than 45 universities

Associated Organisations

United States

(This figure has not been stated)

Japan

60 universities and colleges

ADDENDUM 3**SUPPLEMENTARY INFORMATION
OFFERED BY SOME OF OUR MEMBERS****Estonia****Supplementary information on university education system**

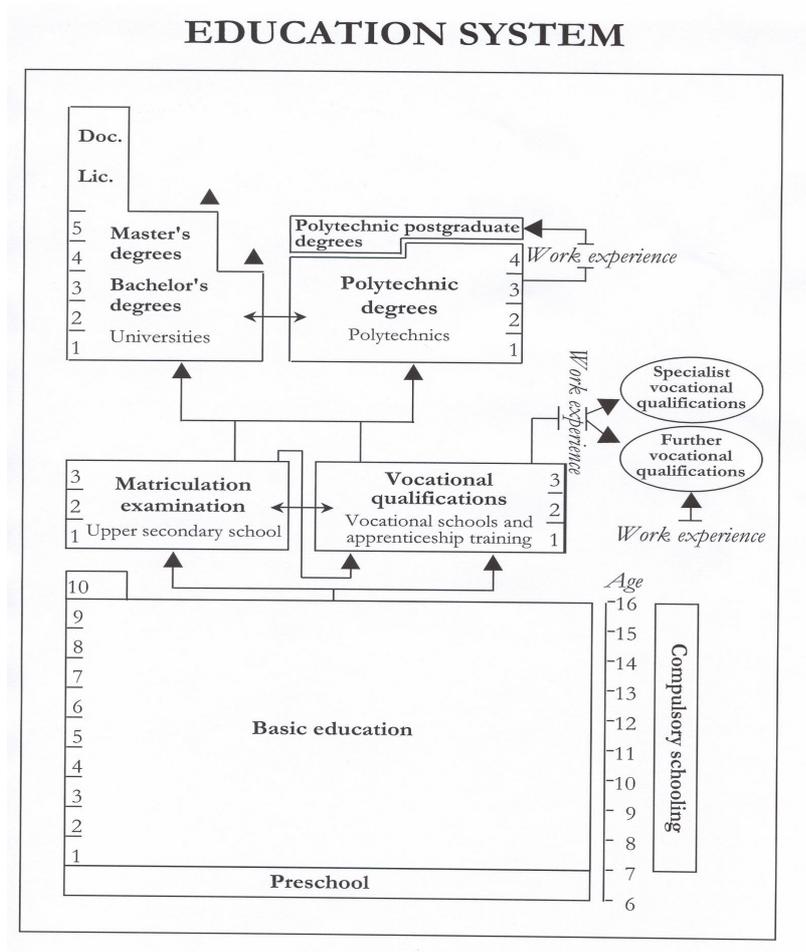
In the first stage the civil engineering courses involve the study of basic subjects such as mathematics, physics, technical mechanics, geodesy and building materials. In addition they acquire knowledge of general engineering, economics and other disciplines such as micro- and macro-economics, informatics, environmental protection. Numerous specialist subjects can be studied in the following stages including practical training to acquire the profession of a civil engineer.

The civil engineering curricula are internationally recognised.

GENERAL STUDIES 20.5 credits		
Philosophy	Science of risk and safety	Foreign language for academic purposes
Environmental protection	Organisation of studies	Micro- and macro- economics
Grounds of law	Foreign language for science and research	Economics in construction enterprises etc.
BASIC STUDIES 36.5 credits		
Mathematical analysis	Linear algebra	Chemistry
Differential equations	Descriptive geometry	Graphic construction design
Probability theory	Physics	Graphic construction design etc
CORE STUDIES		
CIVIL AND BUILDING ENGINEERING (53 credits)	ENVIRONMENTAL ENGINEERING (51.5 credits)	TRANSPORT ENGINEERING (53 credits)
Structures of houses	Thermal engineering	Fundamentals of transport engineering
Soil mechanics	Building physics	
Technical mechanics	Technical Mechanics	Soil mechanics
Structural mechanics	Structural mechanics	Technical mechanics
Organisation of construction Geodesy	Hydraulics	Structural mechanics
Building materials, etc.	Geodesy	Hydraulics
	Building materials, etc.	Geodesy
		Design of roads, etc.

SPECIAL STUDIES		
58 credits	59 credits	56 credits
Architecture	Hydrology and hydraulic structures	Organisation of road construction
Building physics	Heating and ventilation	Road construction materials
Foundations	Water supply	Road maintenance
Timber, masonry, reinforced concrete, steel and bridge structures	Water supply and drainage inside buildings	Timber, reinforced concrete and steel bridges
Renovation of buildings	Heat supply	Road construction
Building technology	Indoor climate of buildings	Traffic in towns
Construction management	Landscape ecology	Theoretical geodesy
Construction investments	Environmental management	Global Positioning System
Economics of real estate	Waste water treatment	Digital cartography
Project management in construction etc.	Renovation of sanitary engineering systems	Photogrammetry
PRACTICE		
4 credits	4.5 credits	6 credits
OPTIONAL COURSES		
8 credits	8 credits	8 credits
GRADUATION THESIS		
20 credits	20 credits	20 credits
DIPLOMA OF ENGINEERS' STUDIES (equates to Master of Science in Engineering)		
Doctorate: 160 credits - speciality: Civil and Environmental Engineering		
DOCTOR OF ENGINEERING		

Finland



Hungary

Supplementary information on

(1) DESIGNER'S ENTITLEMENT

(1.1) Designing activities subject to licence and HCE membership

Any structure to be built in Hungary must be designed as the responsible designer by a natural person who is a registered member of the locally competent Hungarian Chamber of Engineers (HCE) and has acquired entitlement from the HCE for the specific area of the profession to design projects of the particular size and complexity. Those entitled are listed in the Designer's Register of the HCE. The list can be accessed on the Internet homepage www.mmk.hu.

No legal entity must offer design service, unless it is guaranteed that all responsible designers on the particular project have acquired Hungarian entitlement for their specific area of professional activity.

The responsible designer is responsible financially and legally for any designs he/she has made and signed (obligatorily), further for the work of any assistant he/she has employed on the work.

The designer is checked for his/her entitlement by the authority issuing the project implementation permit. The permit is refused on noting illegal designing. HCE also exercises surveillance over designers' entitlement and starts legal proceedings against persons or corporations found to engage in designing activity without entitlement.

(1.2) Relevant acts of legislation

Laws: Act LXXVIII of 1997 on shaping and protecting the built-up environment

Act LVIII of 1996 on the professional chambers of designing and expert engineers and architects

Act C of 2001 on the recognition of qualifications and certificates in the European Regions

Law Decree 157/1997 (IX) on the general rules of architectural-engineering designing entitlement

The detailed rules of entitlement in specific areas are set forth in ministerial orders.

Chapter III of the HCE Registers of Designers contains titles of these orders together with the designer's entitlement.

(1.3) Areas of designing under HCE's competence

In the areas of architectural-engineering design HCE's sphere of competence covers the establishment (withdrawal) of designer's entitlements of persons who have gained qualification on projects in different areas.

(1.4) Project design stages reserved for entitled responsible designing engineers

1.4.1 *Architecture-engineering:*

Architectural-engineering documents set forth in Act LIIVIII of 1997 on the shaping and protection of the built-up environment, § 32, indent (1), all design stages from project designing permit plan to construction drawings. The stages of designing and the substantial requirements of the documents are detailed in the orders on substantial requirements, eg. Order 45/1997. (XII.29) KTM.

1.4.2 *Activities attendant occasionally to architectural-engineering designing*

- a) designing in preparation of, related to or serving directly architectural-engineering designing, in particular baseline survey, study of alternatives, feasibility study, planning programme, geotechnical exploration and report, construction surveying,
- b) on-site representation, resident engineer.

(1.5) Designers' categories and the relevant entitlements

Designers in a specific area are classified into two categories, depending on their qualification and expertise:

- Designer Category "A" (also called "leading designer") is entitled to perform any designing activity in his/her specific area.
- Designer Category "B" (also called "designer") is entitled to design projects listed in the order which sets forth the detailed rules of entitlement. Designers of a lower level of qualification are permitted to be responsible only for design of simpler projects which present a lower risk.

The criteria (qualification, academic degree: MSc or BSc, further the prescribed number of years of designing practice) according to which HCE grants Category "A", or Category "B" entitlement are set forth in the order on the detailed rules of entitlement.

(1.6) Requirements of establishing designer's entitlement

Hungarian citizens, citizens of third countries in possession of residence permit, further citizens of the European Economic Region intending to reside in Hungary for economic reasons may perform design work subject to a permit, providing that they meet the following requirements:

- a) Membership of the Chamber of Engineers competent at the place of residence, in the case of a place of residence outside Hungary, of the Budapest and Pest Country Chamber of Engineers, in the case of a Slovak engineer, of the Borsod-Abaúj-Zemplén County Chamber of Engineers.
- b) Compliance with the professional criteria set forth in the acts of legislation mentioned in (1.2), that is
 - Graduation from a profession-oriented institute of higher education
 - Profession-oriented design practice following graduation over a period mentioned in the legal provisions

For a detailed description of the requirements and the verification procedure reference is made to the "HCE Rules of Judging Membership and Entitlement Applications" (see home page www.mmk.hu).

- c) Passing the entitlement examination, or having been exempted therefrom. For the examination see "HCE Rules of the Entitlement Examination" (home page www.mmk.hu).
- d) Entry (on applications) into the HCE Official Register of Designers.

(1.7) Potential entitlements for application

The entitlements for which applications can be submitted are set forth in legal provisions. For updated information contact the Chamber.

(1.8) Application procedure for chamber membership and entitlement

Applications shall be submitted to the locally competent chamber of engineers.

Attached to the application shall be the following documents:

- b) such personal data of the applicant as are needed for identification in the register of professional chamber members
- c) specification of the area of designing for which the applicant is qualified and/or for which admission is sought
- d) authentic copy of the document of qualification. If the applicant is a citizen of a European Economic Region country, then in lieu of the diploma, the document of his/her engineering designing entitlement valid in his/her home country – confirmed in writing by the professional chamber, or a corresponding organisation competent in the home country

- e) certificate of good conduct not older than three months, unless one was submitted to HCE during the year preceding the application
- f) cheque counterfoil of the fees of entry into the designers' register, of membership admission and of the first year's membership dues: for the current amounts please contact the Chamber
- g) certificate of having passed the entitlement examination, or the application form for the entitlement examination, together with the cheque counterfoil of the examination fee.

The afore-mentioned data shall be entered on the following forms:

- Chamber membership application form
- Entitlement application form

The forms can be downloaded from the chamber's homepage, or by post from the locally competent chamber.

The applicant is notified by the locally competent professional chamber of the decision on entry to the designer's register. The decision on admittance contains the registration number of the designer and the specific areas of designing in which the applicant is entitled to operate.

The entry to the designer's register remains valid for members of the chamber over a period of five years, but only for the years for which the membership fee is paid. The validity can be renewed thereafter as provided for in other acts of legislation, otherwise the entitlement expires.

(2) EXPERT'S ENTITLEMENT

(2.1) Expert services in Hungary are subject to an expert licence and HCE membership

The title of engineering expert is reserved in Hungary to natural persons. A person entitled in Hungary is only licensed to write an engineering expert's report. Legal entities are barred from issuing expert reports, unless this is written and signed as responsible expert by an engineer entitled in the specific area.

A person to be entitled must be

- Member of the Hungarian Chamber of Engineers (HCE) with paid membership fee
- In possession of a licence issued by the HCE for performing expert service and
- Entered on the basis thereof into HCE's "Register of Experts"

(2.2) Relevant acts of legislation

Laws: Act LXXVIII of 1997 on shaping and protecting the built-up environment

Act LVIII of 1996 on the professional chambers of designing and expert engineers and architects

Act C of 2001 on the recognition of qualifications and certificates in the European Region

Law Decree: Law decree 157/1997. (IX.26.) on the general rules of engineering expert services related to the shaping and protection of the built-up environment

Law decree 24/1971. (VI.8.) on expert services

The detailed rules of entitlement in specific areas are set forth in ministerial orders. Chapter V of the HCE Register of Designers and Expert contains titles of these orders together with the experts' entitlements.

(2.3) Areas of expert service under HCE's competence

Identical with those listed in 1.3

(2.4) Requirements of establishing expert's entitlement

Identical with those listed in 1.6.

Ireland

Supplement information on university educating system

There are four **university colleges** in the Republic of Ireland that offer undergraduate degrees in civil engineering.

National University of Ireland, Cork	(also known as University College Cork)
National University of Ireland, Dublin.	(also known as University College Dublin)
National University of Ireland, Galway,	(also known as University College Galway)
University of Dublin,	(also known as Trinity College, Dublin)

The National University of Ireland (NUI) courses at Cork and Galway are direct-entry civil engineering degree courses. NUI Dublin previously had a common entry for all engineering courses, with specialisation into the civil and other streams at the beginning of second year. This college has now changed to a direct entry system, although there is a common entry option for civil or mechanical engineering. The Trinity College Dublin (TCD) course has two common years, followed by two years in the civil or other stream. The NUI colleges award a BE (Civil) where TCD awards a BAI. As well as civil engineering, NUI Galway has introduced a four-year direct-entry degree course in environmental engineering.

There are four **institutes of technology** that offer degree courses in civil engineering or related disciplines

Cork Institute of Technology	B.Eng in Structural Engineering
Dublin Institute of Technology	B.Sc in Structural Engineering
Sligo Institute of Technology	B.Eng in Civil Engineering
The Waterford Institute of Technology	B.Sc. in Construction Management

The Cork and Sligo courses are of five years' duration, comprising a two-year national certificate course, a one-year diploma, followed by a two-year degree course. Both the Dublin and Waterford degree courses are of four years' duration. The degrees in Cork, Dublin and Sligo are accredited by the IEI as satisfying the educational requirements for graduates seeking election to Chartered Engineer.

Terms, semesters, contact hours

There are considerable differences in the term and semester structures of the different university colleges and Institutes of Technology, so attempts to generalise must be treated with caution. Some university colleges follow a three-term system, while others have two semesters. The total teaching period in the university colleges is usually about 24 weeks, commencing in September/October and finishing in April/May. The Institutes of Technology follow a two-semester system, usually with a longer teaching period than the universities (30 weeks).

The total contact hours for the four-year degree programmes are generally below between 2,000 and 2,500.

Examinations are usually at the end of the academic year in the three-term system, or at the end of each semester with the other system.

Short description of the main features of the curriculum for each type of programme

The university civil engineering courses tend to focus on mathematics and the engineering sciences in the early years, and these subjects account for between 40% and 50% of the total contact hours over the four-year degree programme. There is greater emphasis on the civil engineering subjects in the later years, although the opportunities for specialisation vary from institution to institution. A final year project is part of the degree assessment. As well as engineering topics the degree programmes also cover management, communication skills and other topics relevant to the engineer in society. There is perhaps less emphasis on foreign language and humanities courses than is the case with engineering degrees in some other European countries.

Less information is currently available for the Institutes of Technology (IT), but it is probably fair to say that the IT degree programmes – two of which comprise a two-year degree that follows on from a three-year national diploma – place a greater emphasis on applied subjects.

Industrial placements are a feature of many (but not all) civil engineering degree courses in Ireland. As well as giving undergraduates the opportunity of gaining some experience in the practice of engineering, they are seen as valuable in providing links between academia and industry.

Latvia

Bachelor Professional Studies

The purpose of bachelor's level professional studies is to provide second level professional education in the branch of transport structures, to prepare students for independent work in practical engineering as well as to give an opportunity for a student to continue studies in a professional/academic master's programme.

Objectives and main tasks of the programme

The programme of bachelor's level professional studies in the branch of transport structures is delivered in lectures, practical lessons and in guided independent studies with a purpose to acquire knowledge in all related fundamental sciences. Along with the technical subjects there is a space provided for some economical and arts oriented subjects.

During the bachelor's level professional studies, the student obtains necessary proficiency to be able to start work in industry or to continue studies in PhD level studies. While studying in the professional master's programme the student acquires:

- skills of orientation in technical literature and independent research;
- ability to use theoretical knowledge in definition of a particular problem as well as to distinguish problem-solving options;
- ability to plan, execute and to interpret experimental data and results;
- at least 26 weeks of practical work experience.

Professional masters' programme builds a highly intelligent ground encouraging students for wide social and professional interaction with both local and international authorities.

Duration of programme

The programme lasts for 4.5 years and consists of 180 credit points. After successful fulfilment of study requirements, the student is granted a bachelor's level professional degree in transportation engineering and a professional engineering qualification.

Expected academic background

Applicants are admitted to the bachelor's level professional programme '*Transportation Engineering*' if they possess a secondary school diploma or any other diploma comparable with this kind of education.

Code	Title of subject	CP
A	Core courses	117
1.	Subjects of general education	14
1.1	Mathematics	9
1.2	Economics	2
1.3	Communication science (basic course)	2
1.4	Introduction in construction	1
1.5	Physical training	0
2.	Field related theoretical courses and information technology courses	44
2.1	Probabilistic methods in structural analysis	4
2.2	Physics	6
2.3	Computer science (basic course)	3
2.4	Descriptive geometry and engineering graphics	2
2.5	Computer graphics	2
2.6	Physics of structures	3
2.7	Structure of construction materials	2
2.8	Computer aided design of transport structures	3
2.9	Construction materials (basic course)	3
2.10	Geology (basic course)	2
2.11	Structural analysis (basic course)	3
2.12	Structural analysis (general course)	5
2.13	Finite element methods in construction	2
2.14	Mathematics - additional sections for construction	4
3.	Field related professional specialisation courses	59
3.1	Computer science (special course)	2
3.2	Work safety basics	1
3.3	Public safety	1
3.4	Geodesy	3
3.5	Practical geodesy	2
3.6	Inspection of transport structures	2
3.7	Structural analysis (special course)	3
3.8	Urban roads, streets and parking places	2
3.9	Highway design (basic course)	6
3.10	Bridges and structures (basic course)	4
3.11	Structures	6
3.12	Highway design (introduction course)	4
3.13	Hydraulics, hydrology and hydrometrics	2
3.14	Structural foundation	4
3.15	Road construction (basic course)	2
3.16	Highway construction (basic course)	3
3.17	Transport systems	2
3.18	Transport and environment	2
3.19	Road maintenance (introduction course)	4
3.20	Road traffic planning and safety	4
B.	OPTIONAL CORE SUBJECTS	15
1.	Field-related professional specialisation courses	9
1.1	Highway design (special course)	3
1.2	Bridges and structures (special course)	3
1.3	Modern practice of structural design and maintenance	4
1.4	Introduction of traffic flow theory	4
1.5	Aesthetics of transport structures	2

Code	Title of subject	
		CP
1.6	Improvement of roads	2
2.	Subjects of arts / social science un management	2
2.1	General sociology	2
2.2	Management sociology	2
2.3	Political science	2
2.4	Business etiquette	2
2.5	Models of social development	2
3.	Languages	4
3.1	English	4
3.2	German	4
C.	Optional subjects	6
D	Practice	26
E	STATE EXAMINATION	16
1.	Bachelor's paper (including engineer's project)	
Total:		180

Whole programme consists of:

E (exam) - 20

T (test) - 49

S.W. (study work) - 15

Slovak Republic

Slovak civil engineers have graduated mainly from 3 universities:

- The Slovak University of Technology, The Faculty of Civil Engineering (Bratislava)
- University Žilina, The Faculty of Civil Engineering (Žilina)
- Technical University of Košice, The Faculty of Civil Engineering (Košice)

The departments of the civil engineering faculties are mainly focused on:

- Concrete Structures and Bridges
- Transport Construction and Traffic Engineering
- Theoretical Geodesy
- Surveying
- Geo-techniques
- Land and Water Resources Management
- Hydraulic Engineering
- Building Structures
- Steel and Timber Structures
- Mapping and Land Consolidation
- Mathematics and Constructive Geometry
- Economics and Building Industry Management
- Physics
- Structural Mechanics
- Material Engineering
- Building Technology
- Sanitary Engineering
- Building Services
- Architecture
- Human Sciences
- Languages
- Physical Education
- Forensic Engineering

The Institute of Forensic Engineering at the Faculty of Civil Engineering in Bratislava:

- delivers forensic assessments in difficult issues demanding expert witnesses on construction claims advanced to trials and other tribunals for resolution on behalf of citizens and organisations according to the Slovak legislation;
- provides lectures in the field of forensic engineering for full-time students;
- provides four-semester specialised post-graduate distance learning course for forensic experts and candidates specialising in civil engineering disciplines.
- prepares specialised post-graduate distance learning course for forensic experts and candidates specialising in geodesy;
- For the Ministry of Justice of the Slovak Republic provides periodical five-year re-training and re-examination of experts registered in Lists of Chartered Forensic Experts (these lists are administered at regional courts of justice in the Slovak Republic).

Various faculties deliver certain services:

Library and Information Centre of the Civil Engineering Faculty

in Bratislava is one of the best equipped and most progressive library centre among all 34 academic libraries in Slovakia. The Library and Information Centre offers lending services for more than 100,000 publications; a wide range of domestic and foreign periodicals and individual learning facilities; modern database centre with 20 PCs with access to many foreign scientific databases and electronic information sources and progressive document delivery service for all library users.

The Centre of Information Technology

provides various services in the area of information technology for the students and employees of civil engineering faculties.

International Activities of Civil Engineering Faculties

The international activities of faculties are mainly focused on the following priorities:

- co-operation with institutions, faculties and departments active in research and curricula development in civil and environmental engineering disciplines;
- introduction of European Credit Transfer System as a precondition for strengthening the faculty's international position;
- international monitoring of programmes taught on faculties together with more than 50 European leading higher education institutions active in the area of civil engineering education (EUCEET Socrates - Thematic Network) as a step towards successful international evaluation;
- EEGECS Socrates-Thematic Network;
- international accreditation of the academic programmes of faculties;
- support of activities enhancing the Slovak University of Technology's international status as a research university;
- broadening active participation in existing programmes of international co-operation, such as TEMPUS, Inco-Copernicus, Leonardo da Vinci, Socrates/Erasmus, Action Austria-Slovakia and CEEPUS. Intensive exploitation of these links for networking activities;
- participation in research programmes. Besides non-European research partnerships special emphasis is given on Fifth and Sixth Framework Programme of the EU, bilateral research programmes with EU partners, and on consortia with partners from Central European region;
- increased participation of the faculties and its experts in bilateral and multilateral projects of cross-border co-operation
- involvement of faculties expertise in EU pre-accession tools such as Phare and new programmes SAPARD and ISPA
- initiate purpose-oriented links with industry and SME-s as partners for programmes of applied research

The faculties are currently affiliated with more than 60 international governmental and non-governmental scientific organisations. The faculties are an active member of the International Association of Civil Engineering Faculties (IACEF) and a guest member at the Permanent Conference of the German-Speaking Countries' Civil Engineering Faculties.

Detailed information on University departments for engineering

The **Department of Concrete Structures and Bridges** concentrates its activities mainly in the area of concrete, reinforced structures and bridges. The main courses of the Department are Concrete Technology, Concrete Design, Advanced Reinforced Concrete, Concrete Bridges and Pre-stressed Concrete Design. Its instruction and research is supported by computer and experimental facilities and by the Laboratory of Concrete Structures.

The **Department of Transport Construction and Traffic Engineering** is a leading department for the education of engineers in the following specialisation: Roads, Motorways, Airports and Railways Planning and Construction as well as Traffic Engineering. It trains students to solve complicated transportation engineering problems of all kinds. Graduates are able to work in planning, geometric design and roads, airports and railway construction as well as in management and research.

The **Department of Theoretical Geodesy** covers education in Mathematical Geodesy, Physical Geodesy, Geodetic Astronomy, Satellite Geodesy, Processing and Analysis of Measurements, and Geo-informatics. Both the theoretical and practical aspects of geodesy are considered.

The **Department of Surveying** offers courses including Land Surveying, Engineering Surveying, Photogrammetry and Remote Sensing, Theories of Measurement and Data Processing, Underground and Mine Surveying, Measuring Systems in Engineering Surveying,

Applied Analytical Photogrammetry, and Industrial Surveying. Surveying, Photogrammetry, and computer laboratories support the educational process and research.

The **Department of Geo-techniques** is usually an interdisciplinary department emphasising courses such as Geology, Engineering Geology, Hydrogeology, Soil Mechanics, Rock Mechanics, Foundations, Underground Structures, and Dams and Reservoirs.

The **Department of Land and Water Resources Management** offers courses in Hydrology, Hydropedology, Hydrometeorology, Irrigation and Drainage, River Channel Engineering and Restoration of rivers, soil erosion and Land Protection, Ponds and small Dams, GIS and CAD applications in water resources, and water resources management.

The **Department of Hydraulic Engineering** covers subjects including Surface and Groundwater Hydraulics, Construction, Economic and Ecological Problems associated with the Design, Construction, maintenance and reconstruction of Hydraulic Structures such as Weirs, Waterways, Harbours and structures for hydropower utilisation. Research and teaching is supported by a Laboratory of Hydraulics.

The **Department of Building Structures** delivers lectures in Building Construction, Studio Design, Typology, Thermodynamics, Acoustics, Day lighting, and the Energy Efficiency of Buildings. Students are trained in the design of construction units, elements, and details through theoretical and experimental methods of reasoning.

The **Department of Steel and Timber Structures** teaches subjects related to the Design and Construction of Steel and Timber Structures such as the Theory, Design, Construction and Experimental Analysis of Building Structures, Bridges, and Special Engineering Constructions with Steel, Timber and Composite Load-bearing Systems. The Department's laboratory provides facilities for the experimental analysis of steel and timber structures used both in education and research.

The **Department of Mapping and Land Consolidation** is involved in the education of students in the areas of Mapping, Land Consolidation, Cartography and Cadastral Mapping. The educational and research activities are backed by geodetic instruments and a computer graphics laboratory.

The **Department of Mathematics and Constructive Geometry** covers all areas of education in mathematics and descriptive geometry. It co-operates with the other Departments in their research and consulting projects. Its teaching is supported by a computer laboratory. The Department's research focuses on the theory and applications of fuzzy sets, numerical analysis of nonlinear partial differential equations with applications to flow-in porous media, free boundary problems and image processing, topological graph theory, computer graphics, and non-standard measurement and integral theory.

The **Department of Economics and Building Industry Management** delivers the lectures and seminars in Management Basics, Management Information Systems, Economy, Financial Management, Project Management, Strategic Management and Marketing, Personal Management, Construction Costs and Price Estimation, Economics of the Building Industry, Management of Building Projects, Accounting, and in several lecture courses, such as Real estate economics, Application systems, Territorial marketing, Production management etc..

The **Department of Structural Mechanics** lectures in subjects covering the theoretical background for static and dynamic analyses of civil engineering structures including Statics, Structural Mechanics, Dynamics of Structures, Theories of Elasticity and Plasticity, Rheology, Non-Linear Mechanics and Numerical Methods in Structural Mechanics.

The **Department of Physics** covers all areas of education in physics. It co-operates with the other Departments in their research and consulting projects. The Department's teaching is supported by laboratory equipment. The research targets of the Department focus on measuring and testing materials and constructions, properties of porous materials used in civil engineering, the computation of heat losses of building constructions, and the teaching of physics.

The **Department of Material Engineering** covers subjects such as Basic Chemistry, Building Materials, Chemistry of Building Materials, Ceramics, Binders, Concrete Technology, Pre-cast Concrete Technology and Testing.

The **Department of Building Technology** provides instruction in subjects including the Technology of Building Processes, Building Technology, Building-service Technology, Site Equipment Theory, Computer-Aided Preconstruction Design, Project Management, Preconstruction Design of Renovation, Environmental Protection during Construction, and Total Quality Management.

The **Department of Sanitary Engineering** offers subjects including the Chemistry of Water, Hydrobiology, Water Supply, Water Distribution, Water Treatment, Urban Drainage and Waste-Water Collection, Water Pollution Control, Waste Water Treatment, Sludge Treatment, and Waste Disposal. Design exercises, laboratory courses and fieldwork complement the instruction.

The **Department of Building Services** lectures on subjects such as Technical Equipment of Buildings, Internal Water and Gas Pipelines, Internal Drainage, TEB Machine Equipment, Ventilation, Heating, Air-Conditioning, Measuring and Regulation, Energy Supply of Buildings and Energy Management in Buildings.

The **Department of Architecture** provides a comprehensive architectural education, including the technical, artistic, special theoretical, and engineering disciplines, and design of different building types for residential, commercial, social, industrial, agricultural and transport facilities. The Department's work also involves housing renewal, the preservation of historical monuments, interior design, urban planning and landscape design.

The **Department of the Humane Sciences** supplements the Faculty's training in civil engineering with subjects such as Political Science, History of Civil Engineering, Macroeconomics, Construction and Commercial Law, Ecology, General Law, Engineering Ethics, the Civil Code and Geo-ecology. Its research is focused on the humanisation of the environment.

The **Department of Languages** supports the Faculty's training in civil engineering with instruction in foreign languages (English, German, and French) at all levels. Classroom instruction includes general conversation, grammar and specialised vocabulary and style appropriate to various civil engineering sub-specialities. Instruction in the Slovak language is also offered for foreign students.

The **Department of Physical Education** supports the engineering training with an extensive offering of athletic activities, including aerobics, basketball, swimming, volleyball, football, skiing, gymnastics, water sports and tennis. Facilities include a large and a small gymnasium, a swimming pool, a dock and various athletic fields.

Authorisation

In accordance with the present legislation, architects and engineers in certain professions require an authorisation (e.g. design) or qualification (e.g. site manager, site supervisor).

This authorisation can be issued only the Slovak Chamber of Civil Engineers for architects and civil engineers (in architecture and in civil engineering professions). Candidates have to prove at least five years of training in the representative profession and show samples of their work. The Slovak Chamber of Architects may also issue the authorisation in design of building construction for architects and civil engineers.

Further education and lifelong education for architects and civil engineers are provided by universities as well as by the Slovak Chamber of Civil Engineers which provides lifelong education for all engineers in the construction sector.

Turkey

The undergraduate curriculum in Turkey as a general outline can be defined as follows;

First Year: Basic Calculus, Physics, Chemistry, Computer Programming, Geology, Technical Drawing, English Reading and Writing Skills, Introduction to Civil Engineering

Second Year: Differential Equations, Engineering Mathematics, Surveying, Engineering Mechanics, Materials Science, Engineering Economy, Mechanics of Materials, Non-technical electives and non-credit History/Literature courses

Third Year: Statistical Methods for Engineering, Structural Mechanics, Soil Mechanics, Foundation Engineering, Transportation and Traffic Engineering, Fluid Mechanics, Hydromechanics, Engineering Hydrology, Reinforced Concrete Fundamentals, Structural Analysis, Summer Practice

Fourth Year: Water Resources Engineering, Fundamentals of Steel Design, Summer Practice, Technical Electives according to student divisions and field of specialisation with the content of design courses on Structure, Hydraulics, Foundation Engineering, Transportation, Materials Science. Technical Electives are given importance with the variety of engineering contents provided for students. Some of the technical options are; Structural Design, Applied Surface Hydrology, Planning and Design in Water Resources, Advanced Mechanics of Materials, Finite Elements, Construction Management in Practice, Railway and Metro Tunnels, Advanced Material of Construction, Highway Design, Computer Applications, Ground Improvement, Open Channel Hydraulics, Design and Construction of Special Structures, Advanced Structural Analysis, Pre-stressed Concrete, Coastal Engineering, Port Planning and Design, etc.

A four-year undergraduate education is given in 46 universities, followed by masters and PhD degrees in most of them (see addendum 2).