GEORGIAN SOCIETY OF CIVIL ENGINEERS OFFICIAL MEMBER OF THE EUROPEAN COUNCIL OF CIVIL ENGINEERS

European council of Civil engineers

*Project Name*

# Seismic Engineering International Center (SEIC)

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| *Implementing Organization* | Georgian Society of Civil Engineers (GSCE) |
| *Collaborating Organizations* | European Council of Civil Engineers (ECCE), World Council of Engineers (WCCE) |
| *Time Frame* | 3 years (January 2018 - January 2021) |
| *Location* | Georgia, Tbilisi |
| *Requested Budget* | 6.5 million euro |
| *Attachments* | Appendices |

Tbilisi

2017

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## 1.Executive summary

This project aspires to initiate establishment of the Seismic Engineering International Center (SEIC) in Georgia.

This project combines the knowledge of seismic engineering geological conditions country with the needs of educational development in the modern construction in Georgia.

A spill-over effect would be the development of SEIC as the main center for training and consulting professionals according to the international standards.

The project duration is three years, after its completion the activities of center will be performed in self-financing mode.

The purpose of the project is to initiate a systematic transfer of EU best practices in the SEIC's activities, in particular in the field of construction, which is at present a critical function for Georgia.

## 2.Project description

**Background information:**

Territorially, seismically active regions is occupied the significant part of the Earth inhabited by several million of people.

According to the United Nations data, in spite of some of its international programs implemented, over the last decade, the number of deaths in the world has exceeded 700,000, 1,4 million people were killed, and approximately 2,3 million people remained homeless. The number of disaster victims is increased to 1.5 billion. The overall economic loss is 1,3 trillion US dollars. In addition, in the years 2008-2012, 144 million people have been displaced (migrant) due to disasters.

The requirements for new buildings are increased which includes heating, comfort, energy efficiency, insolation, and most importantly safety.

At the end of the XX century a new concept of earthquake engineering was developed, the declared aim of which is to increase the reliability of earthquake engineering. The ideology of earthquake engineering envisages again the nature of probability of earthquake happening. The main emphasis is made on the new requirements of realization of the principles of this ideology. New requirements are as follows: it is necessary to study by means of calculations the real behavior of buildings and constructions in case of any possible, even of large, destructive earthquakes.

One more important fact revealed in the new ideology is that the seismologists themselves think it possible to make a quite reliable prognosis of the earthquake of expected intensity in a short, e.g. 50, or 25 year period of time.

Georgia is an ancient country in the Caucasus, due its geographical and geopolitical situation is traditionally the center for South Caucasus, one of between Asia and Europe, in which still in III-IV centuries were established Colchis Academy, in XII century Gelati and Ikalto Academies. Georgia is the old culture center in border.

Georgia represents a having complex terrain and seismic engineering geological conditions country, hence the design as well as construction needs high professionalism.

Despite the fairly high-skilled qualification most of Georgian building meets the modern demands unprepared. Independent post-Soviet states have certain lagging in comparison with European countries in implementation of new construction techniques and methods of learning.

The Georgian engineers, who were building the Enguri and Aswan dams, Moscow and Tbilisi Metro, Bichvinta complex, bridges, roads, tunnels and many unique building, whose exclusive seismic structures (that was implemented in all seismic Republics of Soviet Union,), today are abroad for search the job.

It should be noted that the Georgia was leadership in the Soviet Union construction of the seismic construction. First norms of seismic resistance of the Soviet Union were developed in Georgia by Academician Kiriak Zavriev in 1927. Dynamic theory of seismic stability in the world was first proposed by him, which is declared in the international encyclopedias.

Several scientific research organizations were working with us, and researches have been conducted around many interesting problems that are valuable archival materials for future research. The techniques of engineering seismology, especially the microseismic zoning techniques, engineering proposals of seismic resistance of structures, etc, were developed.

In Georgia, is still going active seismologist researches. Seismologists have developed probabilistic seismic maps of the country.

The Georgian National Academy of Sciences is working on the study of scientific problems of natural disaster.

There are several innovative proposals in Georgian University of international importance, such as early prediction (time and intensity) system of earthquake.

The establishment in country of market economic relations, the transition from earlier existing massive typical construction on individual construction, modern architectural planning, seismic resistance and increased requirements on the construction, as well as execution of works by new technologies with keeping of international norms and rules, necessitates the appropriate training and retraining of civil engineer's personnel, their involvement in lifelong learning system.

Georgia, as a standing of European integration way country, in construction are increasingly taking place European and other countries investors, accordingly are expected in future execution of large-scale projects, that will require an implementation and creation of advanced, modern, based on world experience regulatory documents.

In Georgia, Tbilisi, May 29-30 on joint conference of "European Council of Civil Engineers" (ECCE), "Georgian Society of Civil Engineers" (GSCE), "World Council of Engineers" (WCCE) and the Ministry of Regional Development and Infrastructure of Georgia on topic "Seismics-2014.

Seismic resistance of buildings and rehabilitation", was signed a declaration in which in the first paragraph was mentioned on the establishments of ,,Seismic Engineering International Center" in Georgia that gives the possibility by participation of local and foreign leading specialists, based on preliminary prepared by "European Council of Civil Engineers" (ECCE), "World Council of Civil Engineers" (WCE) and the British "Institution of Civil Engineers" (ICE) mutually agreed program, to prepare and facilitate the in Transcaucasia and Eastern European countries the professional training of civil engineers and raise their status and prestige.

The UK "worldwide, it was founded in 1818, has received a royal charter in 1828. It includes more than 80,000 professional qualified engineers worldwide, is authorized to grant the title of engineer, as a member of the "Institution of Civil Engineers", is participant of the Washington Agreement, which provides a mechanism for the mutual recognition of diplomas engineer.

There are appropriate training programs and methodical textbooks, highly qualified teachers staff, which provides training of specialists at the international level.

The establishment of mentioned center is also supports and welcomed by "Japan Society of Civil Engineers" (JSCE).

***Goal of the project:***

The basic goals of "Seismic Engineering International Center" represents in accordance with the international technical regulations, professional training of civil engineers in earthquake and their construction field, increasing of their qualifications, status and prestige, that will contribute to the building protection from earthquake.

The goal of the project is to promote Georgian Society of Civil Engineers (GSCE) and European Council of Civil Engineers (ECCE), World Council of Engineers (WCCE) partnering and collaboration activities; to support in process of development construction activities and educational projects and generating economic benefit for the region.

The project foresees implementation of its goal through organizing a training programs, consultation activities, scientific conferences on seismic matters and bringing the results of

research to the attention of the specialistს, professionals public; Preparing the materials for publication research, achieving sustainability of the field research,

The purpose of this project is to provide information and training for professionals and society, with particular emphasis on the region's historical conditions, current construction activitiess and to support regional construction' development process.

This project also aspires to be an educational vehicle for engineers, architects, government officials involved in the construction planning and the public at large by partnering and collaborating with GSCE.

### 3.Main objectives:

Beyond this major project, one of CSCE's strategic objectives is to upgrade its standards in all its fields of activity. The project will constitute an opportunity, and give the momentum, for initiating the systematic introduction of standards and best practices. On the basis of lessons learnt from the experience of international partners, the CSCE will adopt its own approach and apply it, with the support of its partner(s), to the following 4 priority areas:

- Construction Process
- Professional Development
- Scientific Research
- Legislation Development

*Diagnosis:*

- Provide an Needs-gap assessment:
- Production capacity of specialist, professionals
- Usage of the modern technology if any
- Socio-Economic conditions of the region
- Workforce availability
- Current standards of construction, volume and quality
- Current monitoring and quality control standards
- External stimulating opportunities
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*Strategy:*

- Who are the potential partners, beneficiaries i.e. engineers, seismologists and so on.
- How to establish benchmarks using the knowledge applied with today's technology and standards
- Exchange of information and experience in the field of Seismology; between institutions, engineers, governmental entities and other persons working in the area of construction;
- How to establish economic viability for the local construction

- How to market the idea to the local professionals for cooperation and "action plan" implementation

*Implementation:*

- Established Center that can develop guidelines, standards of practice, manuals, processes, recommendations and ongoing technical and professional support;
- Utilize the best available resources and products to modernize traditional winemaking without compromising the quality of the product
- Develop partnership amongst the stakeholders i.e. world leading sectors, the Georgian Scientific Research institutions specializing in this area.
- Establish criteria and processes for workforce development

**The main objectives of center:**

The basic goals of "Seismic Engineering International Center" represents in accordance with the international technical regulations, professional training of civil engineers in earthquake and other construction field, increasing of their qualifications, status and prestige, that will contribute to the building protection from earthquake.

- Study and implementation of latest technologies of earthquake and other fields of construction.
- Study of building energy efficiency issues.
- Study of the existing in environment protection global problems and ways for its solution.
- Study and implementation of International Building Codes (IBC) and European Standards (EUROCODE).
- Study and implementation of international experience of water resources utilization.
- To raise the role of engineering intellectuals, civil engineers professional training, status and prestige, and their submission to Europe.
- Holding of international test examinations, and mutual recognition obtained results by the professional societies.
- To assign highly skilled personnel abroad for participation in separate programs, in the development of projects, as well as study courses and share the experience of foreign construction, design firms and public organizations
- Develop and publish methodological recommendations and other methodological documents on issues of design and construction;
- Organize competitions, exhibitions, conferences, seminars and symposia;
- Issue a European Professional Card

**Action Program of "Seismic Engineering International Center"**

The project duration is three years, after its completion the activities of center will be performed in self-financing mode.

The program is divided into:

**Regular courses and seminars.**

Will be carried out within the Construction scope on the following priority themes:

- Study and implementation of latest technologies of earthquake and other fields of construction.
- Study of building energy efficiency issues.
- Study of the existing in environment protection global problems and ways for its solution.
- Study and implementation of International Building Codes (IBC) and European
- Standards (EUROCODE).
- Study and implementation of international experience of water resources utilization.
- Study of health and safety standards of civil engineers.
- Study of project management.

## Targeted programs.

- Will be developed and implemented grounded on requirements of customer countries, international institutions and construction-design organizations that will be interested in the implementation of program and would be in the form of a sponsor.

- Creation of such programs will be performed in the specific order case, directed in order to the customer countries promotion and training necessary conditions. Goals, topics, teaching duration and working language for the specific program will be agreed with the customer.

**Individual study course.**

Will be carried out for improvement of qualification in foreign companies, enterprises, organizations, agencies and academic institutions.

Study course will be carried out in several countries worldwide.

**Consultation service.**

Consultations on the government, institutions, organizations and enterprises, in the following:

- Improvements of personnel qualification and development and improvement of training system.

- Development of training materials.
- Promotion for realization in practice of developed in the training programs process by participant's projects.
- Implementation of international experience.

**Research activities.**

Is directed to innovative projects, improving teaching methods, analysis of training requirements, and creation of testing methodology.

**Publishing activities.**

In accordance with customer organization and own programs requirements, publication of training materials in English, Russian and Georgian or other languages if its needed.

**Training techniques and methods.**

The selection of learning methods will be made by direct purpose due the program and student body.

- Group discussion
- Discussion on specific situation
- The target visits in construction enterprises and organizations
- Work on individual and group projects.

**Listener.**

The trainees will be civil engineers, managers of construction organizations, representatives of state construction field.

**Staff.**

In the activity of center will be engaged in a permanent or temporary basis to work the construction field specialists, local recognized as international level and leading world's scientists from various countries, teachers, experts and practical specialists, consultants, researchers in wider construction sector disciplines, as well as government officials.

- Select, designate and approve the Project Team;
- Draft and submit the Concept Script;

**4. The achieved results**

The two main indicators will be assessing the success of Center activity (the figures are preliminary):

a. Stable financing of Center in self-financing mode;
b. Effective professional training and advanced training process of civil engineers in the center;

- Development of professional training and refresher training programs - 200 program;
- Preparation of Civil Engineers – 500 specialist;
- Vacancy creation - 200 vacancies;

## Pre program activities

- Establish *Center*.
- Form the structure of the project
- Hire project director and another key staff
- Draft and deliver the contracts and agreements for all parties involved
- Develop the process to hire and work with foreign consultants-bidding process
- Develop processes to address the logistical needs of consultants
- Create the curriculum to construct, repair, maintain and safe cleaning of ongoing and certification
- Develop processes to "Train the Trainer" and
- Generate a workforce development manual for training engineers, technicians, and so on using the newly proposed standards;
- Create the process for trainer and trainee selection
- Develop the print materials for different layers i.e. educational and vocational to be used for education and promotion
- Establish the guidelines
- Plan and coordinate educational events;
- Plan and coordinate conferences;
- Prepare publications, video, and all other marketing material for regional and national PR campaign.
- Technology-Science ways adopting standards:
- Develop policy and procedure standards reflecting the best practices in construction around the world
- To focus on the organizational formation, capacity building and realization of its *Centre.*
- Develop new technologies combining the knowledge from scientific and local communities
- Create a *"Quality Control Committee"* that will devise a quality control manual with ongoing Quality Assessment on construction activities, condition of buildings and more
- Piloting the project on a small scale of 3 to 5 buildings
- Measuring the success and achievements

- Enlarge the demonstration scale to 20-30 buildings focusing in micro zones cooperating with 2-3 construction organizations that work according to the standards.

**5. Expected outcomes:**

- Through the European Policy new perspectives of cooperation are opened, including the possibility to provide the Georgia with support to meet EU norms and standards;
- Education and training policies, producers, manuals will be designed and implemented;
- Materials will be developed and disseminated;
- Quality assessment and quality improvements;
- Usage of standards;
- Standardization of construction activities;
- Production of better quality buildings;
- Consulting Center will be up and running.
- To encourage specialists to train engineers, with an emphasis on problems related to the lack of information and knowledge;
- Project will support developing informative and creative public education programs, will serve as an educational resource for the target groups;
- Centre professional staff will be actively supporting education events with help of experts and through training sessions and conferences;
- Facilitate collaboration between older generation of r engineers and new researchers to ensure the transmission of knowledge;
- The project will provide assistance to the Centre in professional development of staff;
- The project will give an opportunity to work in collaboration with the persons responsible for other major directions including scientific research, construction management and the renovation and architectural projects, to develop education and outreach programmes aimed at raising awareness of the international standards;
- Support and coordinate cooperation with European Council of Civil Engineers;
- Support of civil engineers and professional education, raising of their status and prestige and representation of those in Europe;
- Contribution, maintenance of technical, normative and professional standards;
- Enhance establishment and development of relationships with international public organizations;
- Georgian and European scientific and technical progress promotion and economical and social development contribution;
- Future engineers provision with international knowledge and experience.
- Project will result to considerable enthusiasm for the possibilities presented by a transparent and quality approach in construction development process;

## 6. Financing

The center activities will be financed from the following sources:

- Customer local and international physical and juridical persons.
- Study grant projects;
- Donations and voluntary contributions of the society members;
- Revenues from entrepreneurial activities and established by society enterprises, other economic organizations;
- Targeted transfers from state, public enterprises and organizations;
- Incomes of Georgian and foreign citizens and voluntary contributions;
- Educational publishing activities.
- Other revenues permitted by Georgian legislation;

### 7. Realization of project

"Seismic Engineering International Center" will be established in the Georgian capital, Tbilisi (geographical and geopolitical center of South Caucasus).

Project venue will be a private owned entity leased area of 1500 m², for first stage is calculated and employed 44 staff.

Areas will be divided on industrial and educational parts and in them will be arranged:

- Two academic audience, arranged by projector devices and internal telephone systems.
- The conference room and 2 rooms for meeting and seminars. Interpreting equipment.
- Computer laboratory.
- Audiovisual educational laboratory.
- Studio slides and video production.
- Publishing complex
- Language laboratory
- Specialized library and bank of educational materials
- Interpreting and Translation Service
- Experimental Research Laboratory
- First-aid treatment and a medical station.
- Information and Documentation Center.
- Video and TV shop.

### Structure of Center

- Governing body
- Office of International Relations;

- Methodological and certification service;
- Staffing department;
- Construction organizations (firms);

### The partner's role

- Search of donor countries and organizations for financing of center and their interest;
- Providing of training methodological documentation;
- Invitation of international-level scientists and specialists;
- Conduction of examinations;
- Issuance of European Professional Card;

### Operation of professional training center in self-financing mode

- One of the basic conditions of the self-financing mode operation process is material and technical base that will be established by international and local organizations donation and support.
- Preparation of the civil engineers will be paid. Participants are able to pay their tuition fees preliminary or after the completion of study. ("European professional card" on granting the qualification will be given after the certification and payment of the training cost);
- The course graduate would be at his own expense is possible to send on short period in order of improvement of practical professional qualification to the abroad construction and design organizations.

**8. The initial budgetary costs:**

- salary of invited foreign and local-level international level specialists – 2,190,000 Eeuro;
- Staff salary – 1,134,000 Euro;
- Creation and publishing of programs and methodological documentation – 470,000 Euro;
- Price of inventory, equipment and hardware – 1,360,000 Euro
- Rent prices of training and industrial areas – 810,000 Euro;

Unforeseen expenses - 536.000 Euro;

Total – 6.5000.000 Euro