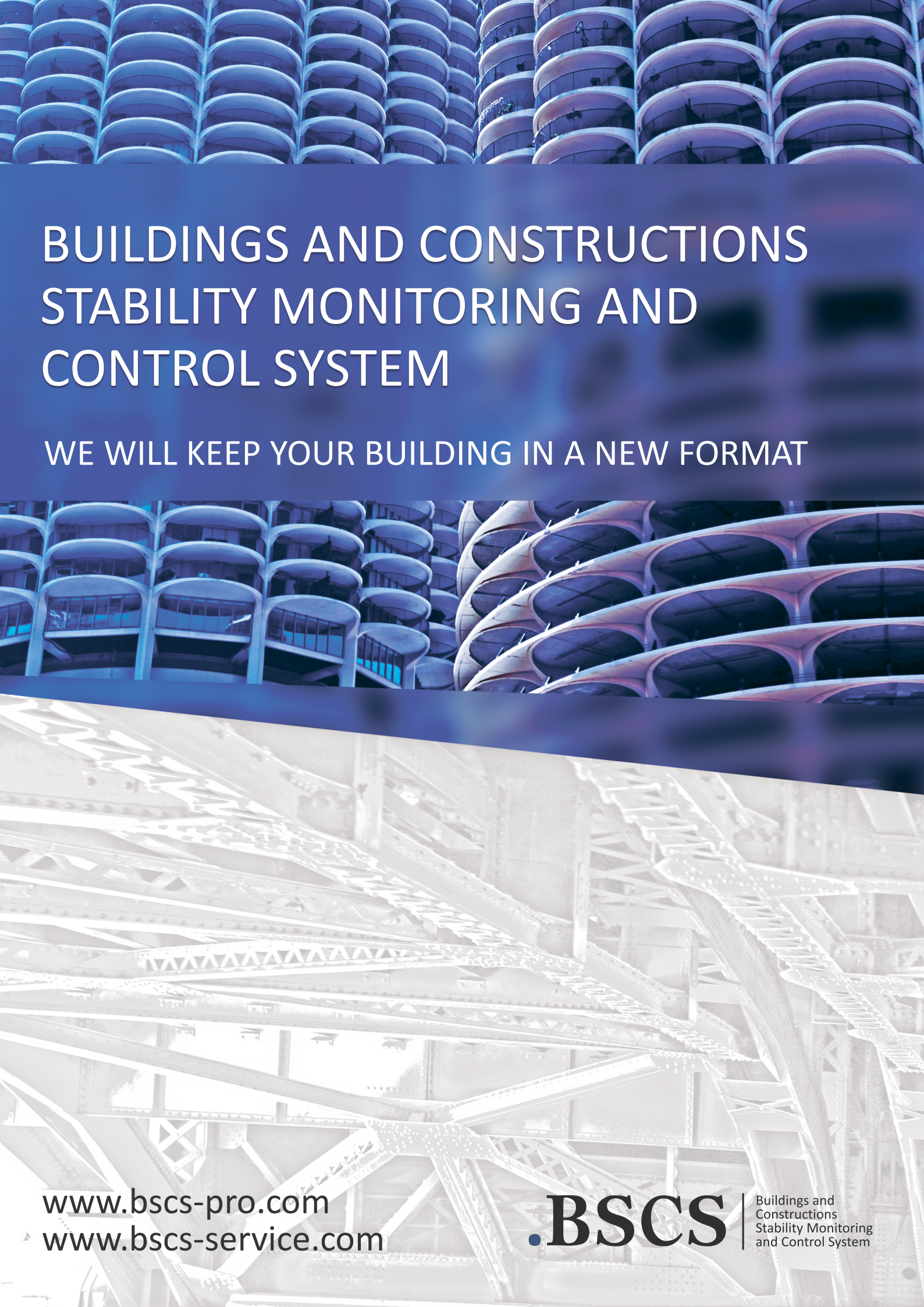




BUILDINGS AND CONSTRUCTIONS STABILITY MONITORING AND CONTROL SYSTEM

WE WILL KEEP YOUR BUILDING IN A NEW FORMAT

www.bsccs-pro.com
www.bsccs-service.com

.BSCS

Buildings and
Constructions
Stability Monitoring
and Control System

“Labrina Trading Ltd.” with the help of “BASIS” Company has developed and offers a new method of designing and implementing an SHM-system for monitoring structures of buildings and facilities - BSCS (Buildings and Constructions Stability Control and Monitoring System) by using BSCS Developer Service.

The proposed method is based on using web-technology and grants some benefits to system developers, engineering designers, installers of SHM-systems as well as to investors and developers.

We have created a web-portal www.bscs-service.com consisting of several sections providing step-by-step instructions on development, implementation and maintenance of BSCS system.

The main idea of our new online service is to facilitate the work of our Customers, SHM-system designers and developers, to grant them an opportunity to concentrate control and performance of all the work on the SHM-system within their company. At the same time they must possess the opportunity to get all kinds of assistance on the project and all the information required – from step-by-step instructions to the maintenance of the most important part of the project – intellectual support including computer modeling of the structures and developing Monitoring Passport.

BUILDINGS AND CONSTRUCTIONS STABILITY MONITORING SYSTEM (BSCS)

Hazardous natural and geological process and phenomena monitoring

BSCS is a Structural Health Monitoring System (SHM-System) developed by “Labrina Trading Ltd.” with technical assistance of “BASIS” Company.

The purpose of BSCS system:

- Continuous real-time control and monitoring of structural changes of buildings and facilities, substructures, engineering protection facilities, landslides and other hazardous natural and geological processes and phenomena in construction sites and maintenance areas
- Real-time notification and informing about critical changes in structural health of buildings and facilities, hazardous natural and geological processes and phenomena developing, decision-making support

The purpose of monitoring:

Protection of people staying inside buildings, facilities and territory of the site

Early detection of negative structural changes of buildings and facilities

Detection of hazardous natural and geological processes and phenomena developing

Effective and efficient informing of operators on duty, owners of the site and/or other authorized staff about critical structural changes of the site or hazardous natural and geological processes and phenomena developing within construction site or facility maintenance area



BSCS DEVELOPER SERVICE PERFORMANCE CAPABILITIES

BSCS Developer Service provides a full range of services to support Structural Health Monitoring Systems (SHM-systems) of buildings and facilities development, implementation and maintenance, as well as hazardous natural and geological processes and phenomena monitoring. The services include support of the following:

- ☐ Pilot project development support
- ☐ Site inspection support
- ☐ Modeling and dynamic features extraction support
- ☐ Monitoring Passport development support
- ☐ Working documents development support
- ☐ Project documents audit
- ☐ Commissioning support
- ☐ Monitoring system maintenance support

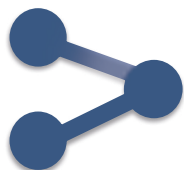


PILOT PROJECT DEVELOPMENT SUPPORT. The service includes a set of instructions, recommendations and common solutions required at the preliminary stage of SHM-system design and development.



SITE INSPECTION SUPPORT is remotely performed by our specialists , based on raw user data or via in-situ measurements of the site features (natural frequencies and waveforms) by sending our technicians to the Customer site followed by making resulting conclusion and recommendations after the site inspection is made.

Our system solutions are based on our wide project experience and our patented technologies.



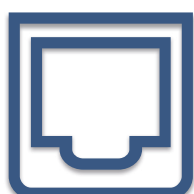
MODELING SUPPORT is a service meant for creating a computer model of the site. It determines its structural dynamic features required for Monitoring Passport developing.



MONITORING PASSPORT OF THE SITE – a body of documents and models: real-time and instrumental monitoring, computer model of the site, boundary values matrix of the parameters to be under control for each type of structural loads.



WORKING DOCUMENTS DEVELOPMENT SUPPORT includes the set of instructions, recommendations and common solutions required for working documents development. The service includes a web-configurator. With its help a User gains an opportunity to create structural schemes, software and hardware specifications and electrical schematic diagrams in automatic mode.



PROJECT DOCUMENTS AUDIT – a web-service that enables project documents examining by experts in the field of Structural Health Monitoring Systems development. As the result of this procedure a User obtains a list of comments and recommendations required for successful project implementation.



COMMISSIONING SUPPORT – a set of consulting services and recommendations on erection of equipment, software and hardware installation and setting-up.



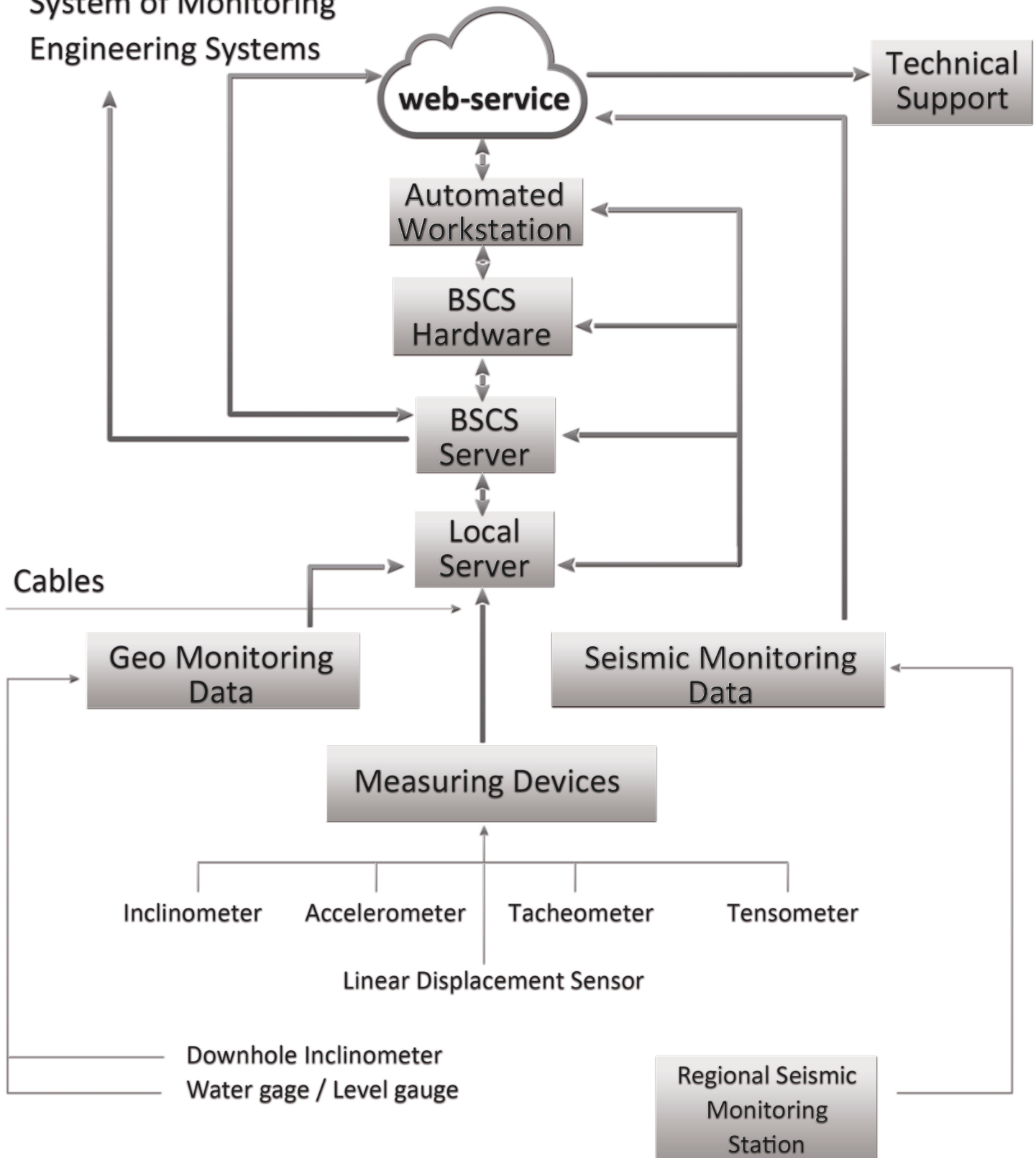
MONITORING SYSTEM MAINTENANCE SUPPORT can be carried out by the own services of the site, or remotely, by BSCS-specialists, via BSCS Developer Service portal www.bscc-service.com.



TECHNOLOGIES

Structural Scheme of BSCS:

System of Monitoring Engineering Systems



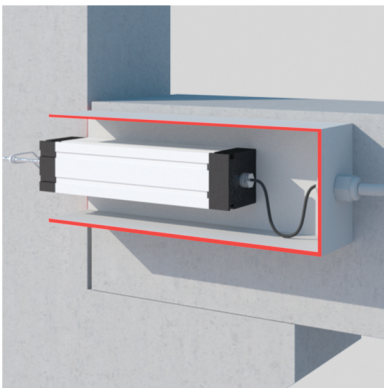
Measuring Devices:



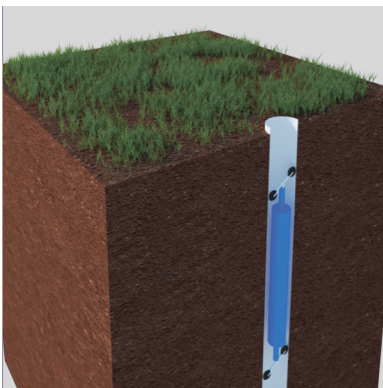
Inclinometer



Accelerometer



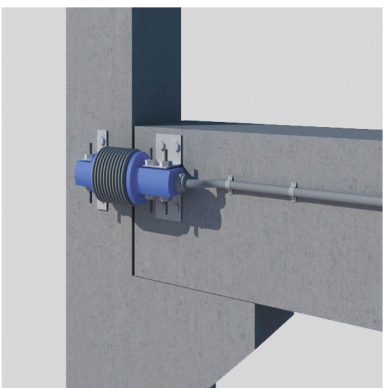
Linear
Displacement Sensor



Downhole
Inclinometer



Tacheometer



Tensometer



Water gage /
Level gauge



GEO-MONITORING is carried out for basements, buildings, facilities, engineering protection facilities, avalanching, mudflows, landslides and is performed as one of the main tasks of BSCS.



SEISMIC MONITORING is carried out for monitoring seismic processes in the area of buildings and facilities equipped with BSCS. The obtained data are used for identifying reasons for changes of state and condition of buildings and facilities registered by BSCS, and also for evaluation of hazardous seismic processes influence on structures of buildings and facilities.



CABLE NETWORK is a set of networking equipment and cables providing data exchange among system units.



LOCAL SERVER is an industrial fault-tolerant computer meant for concentrating data obtained from measuring devices and transferring the data to BSCS server.

TELECOMMUNICATION STAND is a construction meant for convenient, compact, technological and safe fixing of telecommunication equipment – servers, routers, signal converters.

For the description of BSCS Server, Hardware and Automated Workstation see p.p.7-11.



AUTOMATED WORKSTATION of the operator is a personal computer equipped with extended graphic facilities for correct displaying graphics required for visual control of BSCS measuring devices and acoustic system for notifying the operator in case an accident (or emergency) happens.



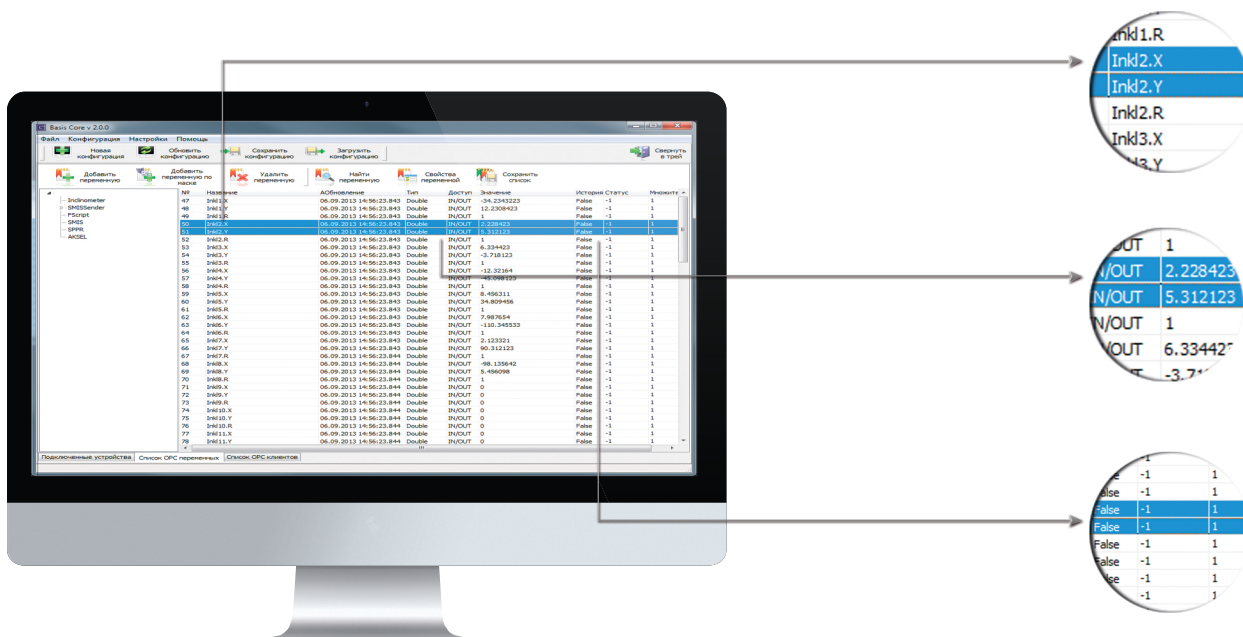
TECHNICAL SUPPORT is a department within a company performing remote support of BSCS hardware and software located at Customer's sites.

When designing BSCS monitoring system we use the following hardware:

BSCS Local Server Hardware

BSCS Local Server Hardware performs the following:

- ☐ Collects raw data from measuring devices
- ☐ Converts analogue data from accelerometers into acceleration values and determines structural natural frequencies of the building or facility
- Transfers the data to BSCS Server
- ☐ Controls ADCs operability
- ☐ Synchronizes all ADCs
- ☐ Sets up sub-spectrum for input signals for ADC (analog-to-digital converter) channels
- ☐ Controls sensors power supply
- ☐ Forms temporary data bases





BSCS Server Hardware

BSCS Server Hardware in real-time performs the following:

- ☐ Receives data from BSCS Local Server and processes them
- ☐ In case of incident or emergency, forms and transfers messages to the operator of BSCS Automated Workstation
- ☐ Archives, documents and saves all the data obtained from the sensors onto a hard disk
- ☐ Transfers all the data about structural health of building or facility to the BSCS Automated Workstation
- ☐ Synchronizes BSCS Local Servers

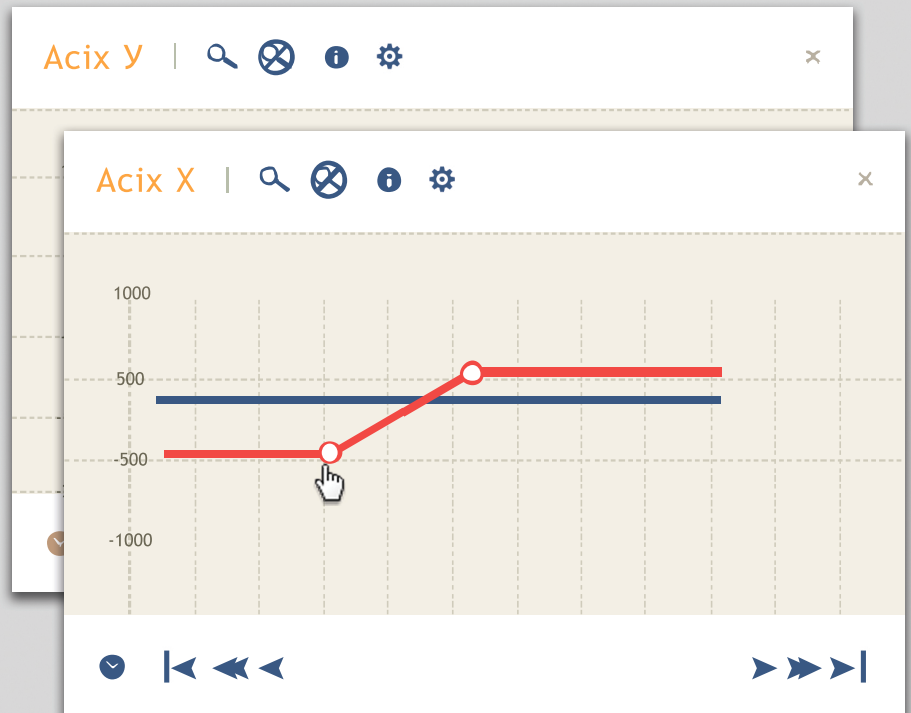


1 2 3 4 5 6
7 8 9 10 11 12
13 14 15 16

Sensors status

Sensors indications
trends over time

ON THE DISPLAY OF BSCS SERVER YOU CAN SEE
CURRENT STATUS OF THE EQUIPMENT FOR
STRUCTURAL HEALTH MONITORING OF THE
BUILDING (FACILITY):



Inclinometers indications

X-direction	-2309.61
Y-direction	-650.139

Current indication of
the selected sensor

Boundary values for
each selected sensor

Boundary value, X-direction

Red_up	yellow_up	yellow_down	red_down
1000	500	-500	-1000

Boundary value, Y-direction

Red_up	yellow_up	yellow_down	red_down
1000	500	-500	-1000

SAVE

DOWNLOAD

READ
AUTO

READ
MANUAL

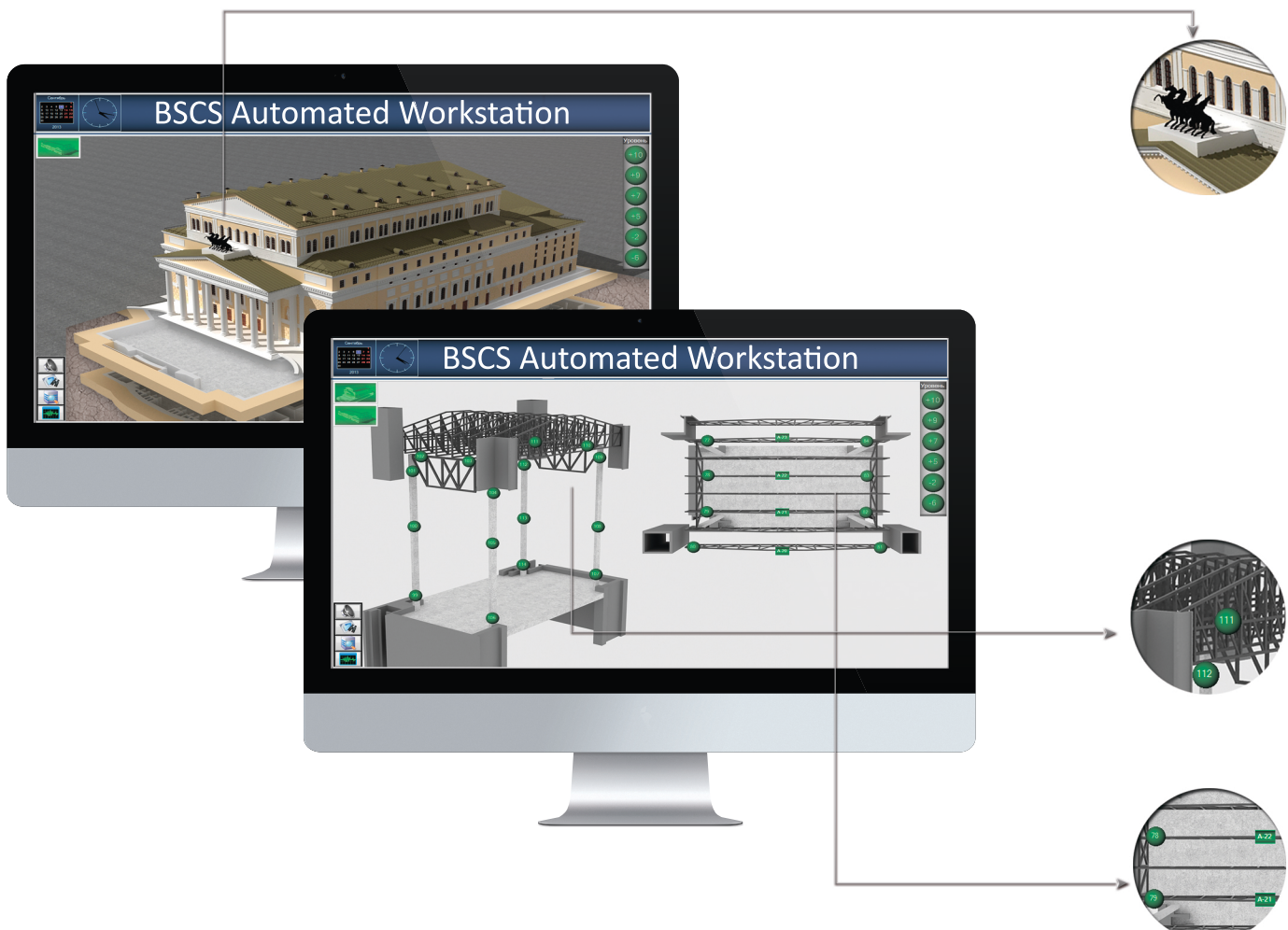
DELETE



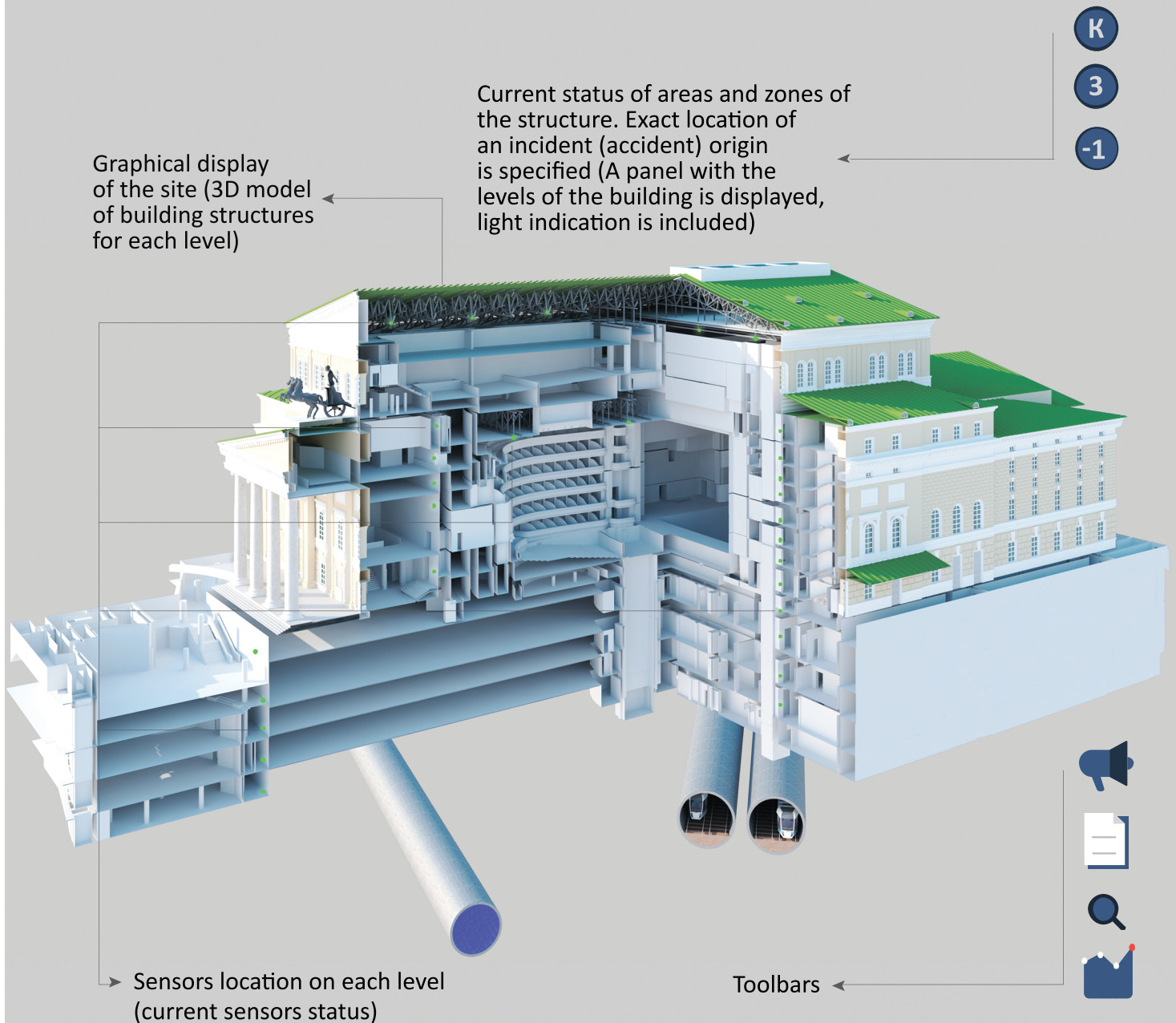
BSCS Automated Workstation

BSCS Automated Workstation performs the following functions:

- ☐ Displays the following data obtained from BSCS Server: structural health status of the site, information on possible evidence of hazardous natural and geological processes and phenomena and defines the exact location of the source of an incident
- ☐ Displays the messages about an incident (accident) and provides recommendations
- ☐ Grants access to the archived data about structural health status during the whole maintenance period



BSCS Automated Workstation





PRODUCTION

“Basis” Group has developed their own measuring devices ideally matching the aims and purposes of monitoring. The first measuring unit of domestic manufacture was a high-precision digital inclinometer with superior maintenance features: wide range of measured values and high-level protection from hazardous environment. All measuring devices are certified.



Inclinometer

THE SET OF EQUIPMENT FOR RESCUE TEAMS (SERT)

SERT is meant for:

- ❑ Automated real-time monitoring emergency buildings, registration their structural health changes (tilt angles and cracks opening).
- ❑ Timely notifying Rescue Teams about emergency buildings structural status changes.



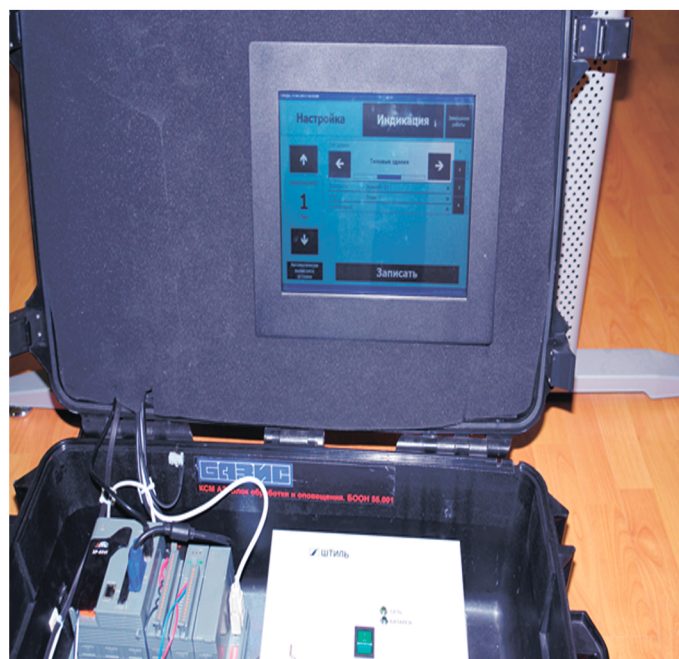
Rescue Team

The Set of Equipment for Rescue Teams consists of the following portable cases:

- ☐ **PROCESSING AND NOTIFYING UNIT.** Receives and processes sensor signals. The unit is equipped with micro-PC with touch pad, wireless modem and UPS (Uninterruptible Power Supply)
- ☐ **MEASURING UNIT SET** (can be located in several cases). The set includes sensors and wireless units for transferring and receiving messages. The set includes sensors of 2 types: inclinometers (tilt sensors) and linear displacement transducers. Information exchange is done via radio in 433.1 – 434.7 MHz range
- ☐ **SPARE PARTS SET.** Includes mounting equipment and spare accumulators (batteries)

Functions of the Set of Equipment for Rescue Teams (SERT):

- ☐ **SERT** receives data from sensors. The sensors must be located in critical points of emergency building structures
- ☐ **SERT** processes the data received from sensors and aims to determine current features of emergency building structures



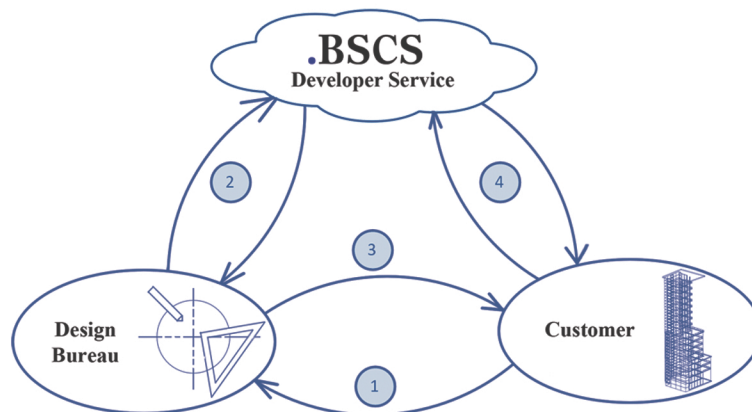


BSCS DEVELOPER SERVICE

BSCS Developer Service is an online service on designing and implementing the SHM-System BSCS (Buildings and Constructions Stability Control and Monitoring System).

BSCS Developer Service is a web-portal and is located at the www.bscs-service.com. It consists of several sections providing step-by-step development, implementation and maintenance of BSCS system.

The main idea of our new online service is to facilitate the work of our Customers, SHM-system designers and developers, to grant them an opportunity to concentrate control and performance of all the work on the SHM-system project within their company. At the same time they must possess the opportunity to get all kinds of assistance on the project and all the information required – starting from step-by-step instructions to the maintenance of the most important part of the project – intellectual support, including computer modeling of the structures and developing Monitoring Passport.

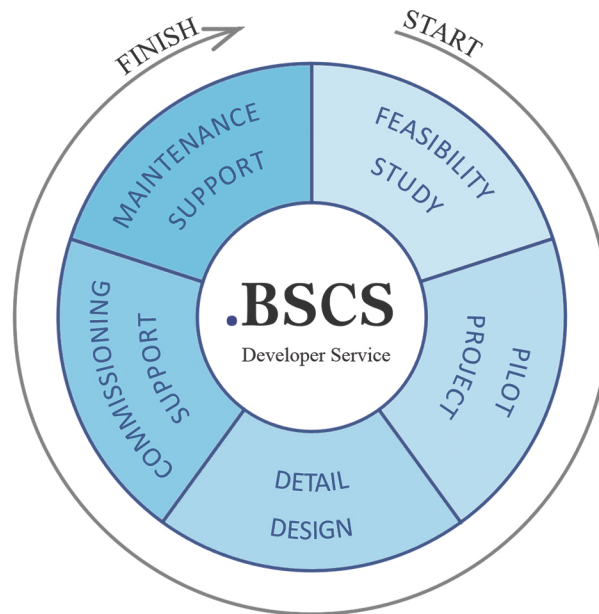


The Scheme of BSCS Development and Implementation is very simple and consists of 4 main stages:

- ☐ The owner contacts the company possessing BSCS-technology and services aiming to create an SHM-system
- ☐ The company possessing BSCS-technology and services develops the whole range of project documents for the Customer's site
- ☐ The company-developer together with BSCS Developer Service specialists performs commissioning at the Customer's site
- ☐ BSCS Developer Service provides the services on BSCS system support at the Customer's site.

THE SERVICES OF BSCS DEVELOPER SERVICE

BSCS Developer Service provides the whole spectrum of tasks on development, implementation and maintenance of the SHM-system – BSCS (Buildings and Constructions Stability Control and Monitoring System).



PILOT PROJECT AND FEASIBILITY STUDY

On our web-portal www.bscs-service.com you can find a calculator which will help you calculate the approximate price of your project performed with the help of different resources – those of your own company, third party contractors and with the assistance of our new online service. Based on the obtained data you can make a conclusion about the advisability of performing the project with the help of BSCS Developer Service.

At the stage of Pilot Project, no matter where you are, by using special online services and according to the templates provided you can form a batch of documents required for your project and get its Block Diagram. At your disposal, there will be information about the number and types of sensors required, their recommended location and average scheme with approximate cost of the project.

By purchasing the access to the Pilot Project service you obtain the constant constituent of the pilot project – a set of ready-made templates and instructions which you can use to create documentation on your project.

The Pilot Project Section includes the service on Monitoring Methodology development. It is a variable constituent of the Pilot project as it comes as an individual feature within each project development and thus it is made by BSCS Developer Service specialists.



DETAIL DESIGN

In this section you are provided with the whole range of services required for developing Detail design.

By purchasing the access to the Detail Design service you obtain the set of ready-made templates and instructions which you can use to create the Detail Design of your project.

Also in this Section there is a range of additional paid services for automatic engineering design and observation of the sites:

- ☐ A configurator
- ☐ Modeling
- ☐ In-situ observation of the site by BSCS Developer Service specialists

By using our **configurator** service you can automaticall obtain some sections of the Detail Design at the same time.

Raw data for the System Configurator are the number and types of sensors obtained earlier, at the stage of Pilot Project (see the corresponding section).

In the dialogue window, by filling out the form you will get all the required information for further performing the project:

- ☐ Technical specification
- ☐ Block Diagram
- ☐ Electrical scheme
- ☐ Principal Block Scheme
- ☐ Software List

According to these documents you and your technical specialists can work out and form Project Documents and identify the list of equipment and all the schemes to connect it.

By using the Service on remote Modeling you will obtain the values of critical constructional displacements and deformations of buildings and facilities. Raw data for modeling are taken from the Pilot Project Section – from the sensors location section. Besides, for exact modeling, certain raw data are required: types and brands of structural materials, precipitation data and their impact on the structures, data on hazardous phenomena and their influence, geological health of substructures etc. All the parameters have to be presented.

If you get any problems in obtaining raw data or you need confirmation of these data accuracy, you can use our service of performing complex observation of the site by our technical specialists.

As the result you will get a batch of Working documents with all required schemes and Monitoring Passport including all site observation results, model calculation, critical values of structural displacements and deformations, the rules of keeping Monitoring Passport within maintenance period of the site.

On completing the works at this stage you can use our service “Technological Audit”: you send us the whole batch of documents made at this stage. In return, we will send you back your documents checked and revised, with comments and recommendations.

ERECTION OF EQUIPMENT. COMMISSIONING. STARTING-UP AND ADJUSTMENT

At this stage you can order the following services from our web-site www.bsccs-service.com:

- ☐ Delivery of all system components accompanied with technical documentation in English, excluding consumables and equipment produced by other manufacturers
- ☐ Computer model verification of structural loads of buildings and constructions - monitored sites
- ☐ Author's maintenance for all project works
- ☐ Commissioning including attracting the technicians of the main Contractor (Attention! All the works on Starting-up and Adjustment shall not be started unless all the required documents on the erection works performed are submitted)
- ☐ System set-up and training the staff of the maintenance service (in English)
- ☐ The set of ready-made instructions
- ☐ Revising meeting all “Erection of equipment” requirements by our technical specialists
- ☐ Technical Audit of Erection works and Commissioning works (if all the acts for completed erection works and other works on the project are signed by authorized organization and submitted to our specialists)

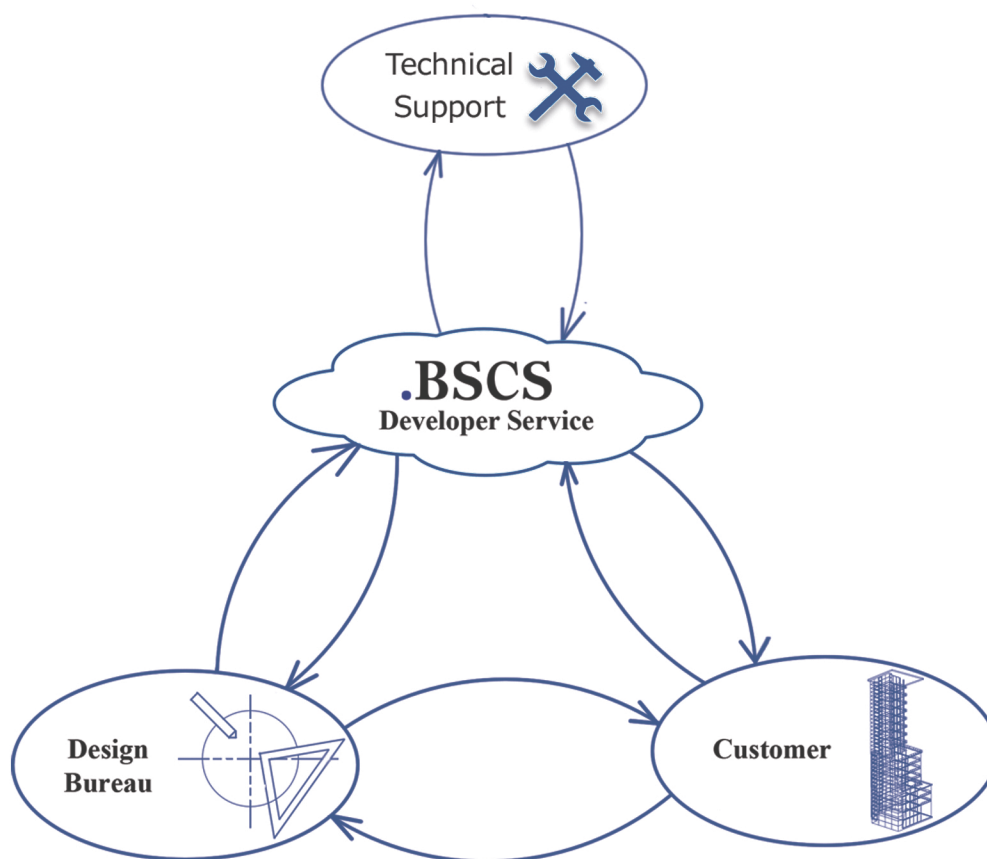


MAINTENANCE SUPPORT

We also suggest using our online BSCS Developer Service for remote support of your SHM-system operation.

Advantages of BSCS Developer Service:

- ☐ Maintenance support in real-time mode
- ☐ 24 hours revising by system operator on duty
- ☐ Online system debugging, fault removal and system emergency maintenance
- ☐ Automated system software update



BSCS system and BSCS Developer Service will ensure high quality of your construction sites – buildings and facilities and help you reduce costs of design and maintenance of your SHM- system, buildings and facilities, avoid risks and save your time and money.

OUR PATENTS



1. A Patent for the method of monitoring structural health of buildings and facilities, and the system for implementing the method.

2,3,4. Patents for the System of monitoring structural health of buildings and facilities, structural components of buildings and facilities in real-time mode.





OUR CONTACTS:

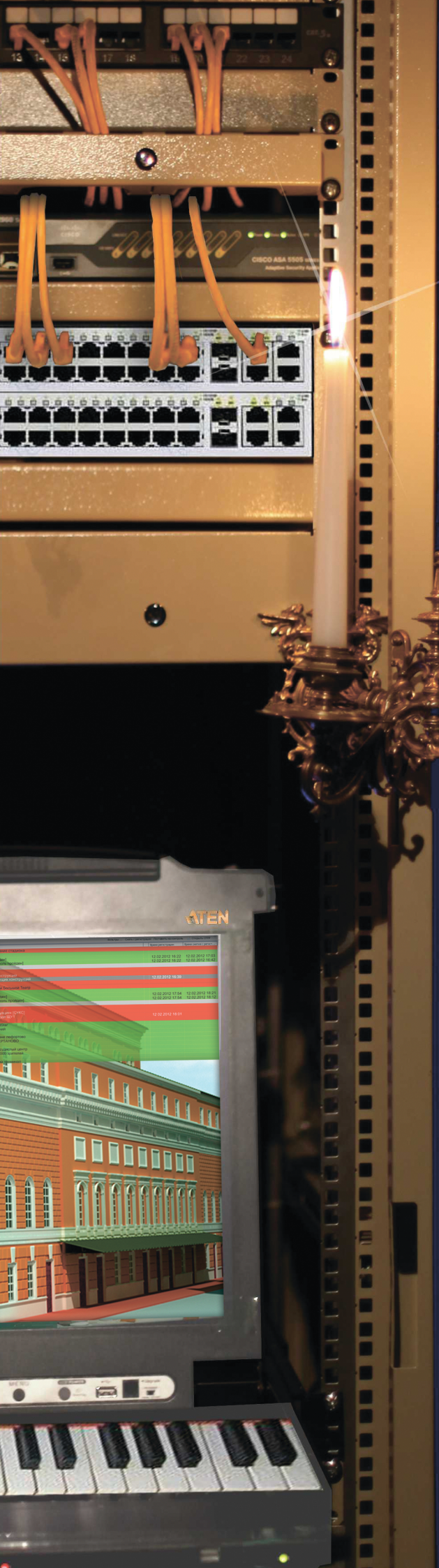
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Art of Work

standard

