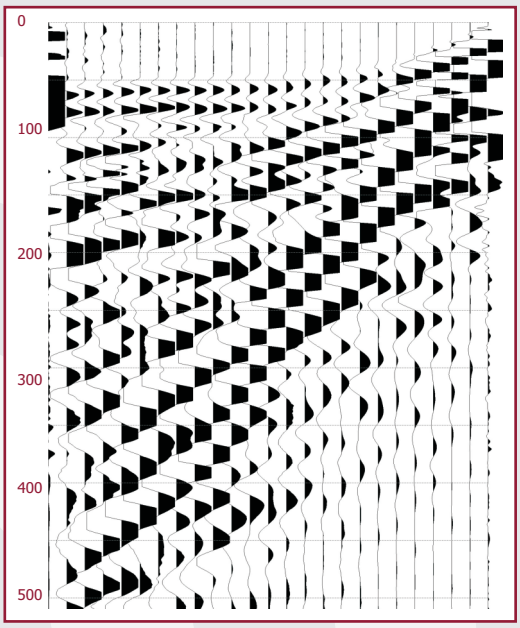
LOGIS-GEOTECH

Group of Companies

SEISMOGRAPHS

MULTICHANNEL SEISMOGRAPH LAKOLIT-X-M4

The Lakkolit-X-M4 is a digital multichannel engineering seismograph, designed for engineering geological and micro-zonation surveys by refracted wave, seismic refraction and vertical seismic profiling methods.



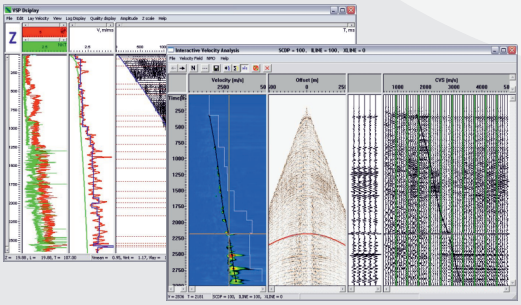
FEATURES

- Data rate up to 100 Mb/s
- Built-in electronic switcher
- Data recoding and preliminary processing by embedded signal processors in real time
- Improved reliability through increased integration.

The station is capable of integrating one or several Lakkolit X-M4 units.
The Lakkolit X-M4 receives and preliminarily processes data from 24 seismic channels. Data is displayed and additionally processed in the field via laptop with application software or a special control unit.
With the Lakkolit X-M4, surveys can be performed efficiently and effectively with only one operator.
The software RadExPro Plus™ is designed for integrated processing of engineering seismic data,VSP survey data processing and geo-radiolocation for Windows 9x/Me/2000/XP.

SPECIFICATIONS

Number of recorded channels	24 to 1,024
Power supply	12±30% V
Power consumption (including switcher)	6 W
Distortion coefficient	0.007 %
Data recording time	16 to 10,240 µs
Record length	up to 5,120 readings
Record delay time (pre-triggering)	±512 readings
Recorded frequency	5 to 4,000 Hz
Effective noise voltage	0.2 µV
Common-mode rejection ratio, min	100 dB
Operating temperature	-40 to +50°C
Electronic unit weight	1.26 kg
Dimensions	250x170x55 mm



SOFTWARE

The software program RadExPro Plus™ operates on standard PCs and workstations for OS Windows

- Full-function shallow surface seismic investigations data processing
- VSP survey data processing
- Geo-radiolocation data processing
- Processing and interpretation of correlation refraction method data.

COMPLETE SET FOR FIELD

1. 24-CHANNEL REGISTRATION LAKKOLIT 24-M4 UNIT

These provide

- Review of recorded data in real time on all 24 channels or on each channel separately, with spectral analysis
- Data archiving for 10-shift operation
- Data rerecording on PC for further processing
- 2 Gb flash-memory capacity
- Interface USB 2.0, Ethernet 100 Base-T
- Embedded GPS receiver for locating geographical coordinates to be entered into the SEG Y file names.

And features

- IP67 protection
- Low power consumption (6 W)
- 640x480 color display
- A lightweight and Small size design.

2. LAPTOP OR SPECIAL CONTROL UNIT (SCU)

SCU is designed to control the Lakkolit X-M4 seismic recording station. It receives and preliminary processes data under hard field conditions (-30 to +50°C, IP67).

3. RADIO TRIGGERING SYSTEM

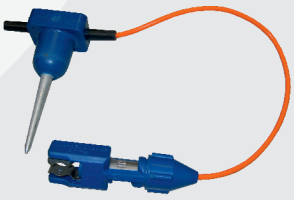
The radio triggering system consists of a receiving unit, a transmitting unit, a receiving antenna, and a transmitting antenna.
The Radio triggering system allows for remote use of the station synchronized with a seismic vibration source via radio channel at a distance of up to 500 m.

4. FIELD SEISMIC CABLE

The field seismic cable is delivered by customer request.
Specifications of the seismic cable (severe operation design is optional), its length, and inter-geophone interval can be varied.

5. GEOPHONES

The required number of different types of geophones can be delivered by customer request.



6. MECHANICAL SOURCE OF SEISMIC VIBRATIONS

Performs seismic operations using refraction and reflection methods

7. INTERMITTENT POWER ELASTIC WAVES SOURCE

Serves for depth investigations of up to 500 meters. The power source cartridges are designed based on the design of hunting cartridges.

DELTA-03 SEISMIC SIGNAL RECORDER

The Delta Seismic Recorder is designed to detect seismic signals from external (natural and artificial) seismic vibrations. It is a permanent seismic station with the possibility of data logging to a removable high-capacity flash disk, and data transmission to a PC for real-time analysis and recording.

The Delta-03 includes the Delta-03M signal recorder, cables, a magnetic antenna, a PCMCIA Flash disk (2 .... 32GB), and a socket to connect with the seismic cable.

FEATURES

- 4 (8) channels for easy connection to any sensor (i.e., seismometers, accelerometers)
- Low power consumption
- Remote control
- Embedded mode of accuracy with internal GPS
- Geophone calibration mode
- Removable mass storage
- Small size and lightweight.

APPLICATIONS

- Micro-zonation surveying
- Earthquake Early Warning
- Aftershock Warning.

COMMUNICATIONS

PC-based via interfaces Ethernet 10/100 and RS-232

SYNCHRONIZATION

Performed in real time;
Recorder uses the high-stability TCXO to maintain time accuracy;
Internal GPS receiver sets and calibrates real-time clock automatically within time points specified by operator or at the command of an operator.

TELEMETERING NETWORKS

The recorder is designed to be part of a telemetering network using the GSM system or satellite modems in the data transfer mode or telephone modems;
Telemetering networking is possible using the Internet via GPRS modems and local networks with an external IP address

SOFTWARE

The software is designed for Windows 9x/Me/2000/XP.

SPECIFICATIONS

Number of channels	4 (8)
Watertight Integrity	Ip66
Temperature range	-40..+60°C
Input voltage	10,5..20B
Power consumption Writing to disk, no communication 4ch (8 ch) Writing to disk, with communication 4 ch (8 ch)	1W (1,4W) 1,2W (1,6W)
Interface: Ethernet RS-232	100Base-T
A/D Converter	24-bit
Gain Selection	1, 4, 16, 64
Maximum Input Signal	5 B
Common mode rejection	not less than 110 dB
Dynamic Range (100 Hz)	133 dB
Noise level (at 50 Hz)	0,013
Sample rates, sps	25, 31.25, 50, 62.5, 100, 125, 200, 250, 500, 1000
FIR Filter	130 dB
GPS-receiver	Internal
Free-running Accuracy	$2*10^{-7}$
Recording capacity	PCMCIA Flash disk (2 ... 32Gb)

IDS-1 PILE TESTING DEVICE

The High frequency two-channel seismic station “IDS-1” is designed for the inspection of metal and reinforced concrete piles to 60 m in length, foundation walls, foundations of road and airport runways, in-ground walls, bridge piles, and other concrete and stone-made utilities.

FEATURES

- Measuring acoustic wave velocity
- Working with different modes of vibration
- Can be used in a downhole version
- Easy and user-friendly interface
- Automatic data processing
- Several languages option (Russian, English)
- Specially designed for a variety of weather conditions
- Free training
- After-sales service
- Consulting webinars.

APPLICATIONS

- Determining the length, integrity, average strength, and defects of piles
- Surveying structures foundation
- Examining concrete hydraulic structures
- Inspecting tunnels, sewers, underground storage tanks
- Measuring thickness of foundation slab and detecting cavities under them
- Examining condition and strength of concrete structure.

SOFTWARE

Specialized PILEMETER software provides automated detection of the length of a pile or rate of the acoustic wave in the pile, and, more importantly, allows one to collect this necessary data easily and clearly.
This Specialized software also helps to determine the thickness and defects of piles using the Impact Echo Principle.

IT ALSO

Once the longitudinal wave velocity in the pile is defined, this software determines the length, integrity and localizing defects of piles.

SPECIFICATIONS

Pile Length , m	**up to 60**
Number of Channels	**2**
Signal bandwidth, Khz	**8; 4; 2; 1; 0,5**
Sample rate, Khz	**96; 32; 16; 8; 4; 2**
Number of date points recorded on the channel	**2048**
Instant Dynamic Range, dB	**95**
System Dynamic Range, dB	**140**
Noise Floor, microV	**0,2**
Distortion, %	**no more than 0,1**
Storage Capacity, MB	**512**
Weight with Built-in Battery, kg	**2,8**
Running time, hr	**10**
Temperature range	**-20 +50°C**
Display resolution, points	**320x240**
Screen size, mm	**120x92**

MULTICHANNEL SEISMOGRAPH LAKOLIT-MT

The Lakolit-MT is a multichannel seismograph for engineering applications and micro-zoning surveying.
The Lakolit-MT provides the user with a flexible multi-channel seismic acquisition system.
In this system, several telemetry units can be linked with the synchronization unit that controls the seismic system.
Each telemetry unit includes a six-channel registration unit and a six-channel seismic cable with geophones.
Using the Lakolit-MT, a specialist can create and build a surveying system,
including 3D data collection.
A laptop/control unit is used to control the seismographs.
The system has a robust casing, allowing it to function perfectly in extreme weather conditions.

FEATURES

- Modular concept
- Robust waterproof metal housing
- Wireless communication
- Remote start of recorders and a seismic vibration source simultaneously via radio channel
- Operation with different synchronization system
- High-quality data registration.

THE LAKOLIT-MT INCLUDES

- Six-channel recorder for recording, digitizing and transmission seismic signals from geophones to the control unit or PC. The recorders can be linked with a six-channel telemetric seismic cable with geophones
- Control unit or PC for controlling the seismographs' operating modes;
- Synchronizer for:
  * setting the same frequency for all recorders
  * charging recorders from battery or external power sources
  * starting the recording using synchronization channel
  * connecting the control unit or PC
- Radio triggering system (consisting of a transmitter and receiver) for remote start of the station synchronized via radio channel at a distance of up to 500 meters
- Three or Six-channel telemetric seismic cable with 2, 5 or 10 meter channel
- Vertical and horizontal geophones.

MULTICHANNEL SEISMOGRAPH LAKOLIT-MT

TECHNICAL SPECIFICATIONS

Channels	6
Frequency, Hz	0,5 ...1000
Sample rate, Hz	250....4000
Power consumption (6 channels), W	1,45
Distortion, %	0,003
Dynamic range (62 Hz), dB	130
Preamplifier gains, dB	1, 8, 64
Noise floor, uV	60
Crosstalk, dB	-120
Common Mode Rejection, dB	120
Data Transmission, mBod	100
Watertight Integrity	IP67
Temperature range, C	-40...+70
Size (length and diameter), mm	232x48
Receiver weight of, kg	0, 35

SYNCHRONIZER (OR TIMER)

Embedded battery V, A/h	12, 9
Power consumption W	1,75
Embedded Wi-Fi	54
Ethernet Embedded 100Base-T	100
Watertight Integrity	IP67
Temperature range, C	-40...+70
Size, mm	260x195x108
Receiver weight of, kg	0, 35
Seismic cable (6 channels)	
Length, m	13,6
Weight, kg	1.6
Seismic cable (3 channels)	
Length, m	7,6
Weight, kg	0,86

THREE-COMPONENT SEISMOMETER SPV 3K

TECHNICAL SPECIFICATIONS

Transducer type	capacitance
Number of components	3 (one vertical, two horizontal)
Operating bandwidth at level of -3 dB, Hz	0.45 to 65
Bandpass flatness not more than 1 dB in frequency range, Hz	0.5 to 45
Dynamic range, dB	at least 100
Conversion ratio, V*c/m	400
Maximum amplitude of signal at symmetrical outputs, V	±10
Constant component at output, maximum, mV	±10
Operational deviation from vertical axis	±15 degrees
Built-in calibration pulse generator, triggered	by seismic recording system command
Power supply:	
option 1: bi-polar stabilized power supply, V power consumption, W	±12±10% 1.12
option 2: unipolar unstabilized power supply, V power consumption, W	3 to 15 1.5
Diameter, mm	160
Height (with handle), mm	135
Weight (without cable), kg	2.9
Operating temperature range, degrees C	-30 to +55
Watertight integrity	IP67

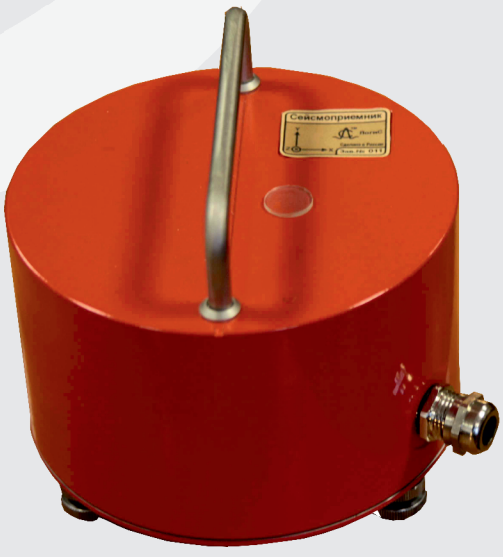
The Three-component Seismometer SPV-3K is designed to convert velocities acting along measurement axes of the Seismometer into proportional electrical signals.

The Seismometer is intended for work with our Seismic Recording System Delta-03, or any other recording system.

APPLICATIONS

- measurement of amplitudes, natural and forced vibration periods of buildings, structures and critical facilities for the purpose of evaluating their seismic resistance
- detailed seismic zoning and seismic micro-zoning
- seismology
- seismic exploration.

The Seismometer can come equipped with a system which records its deviation from a vertical axis with the display of vertical deviation angle or generation of alarm signal in the case of excessive deviation (optional). This information can be used to determine the position of a Seismometer in offshore seismic exploration conditions.



PILEMETER

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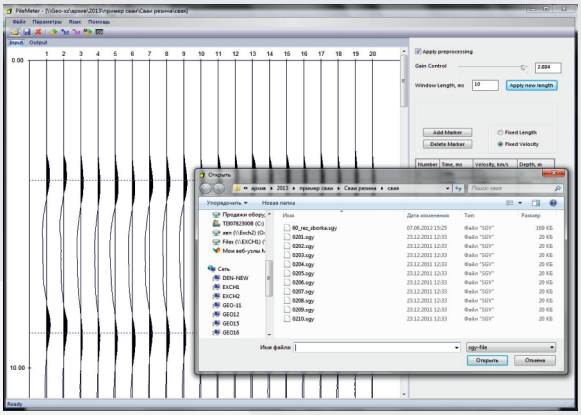

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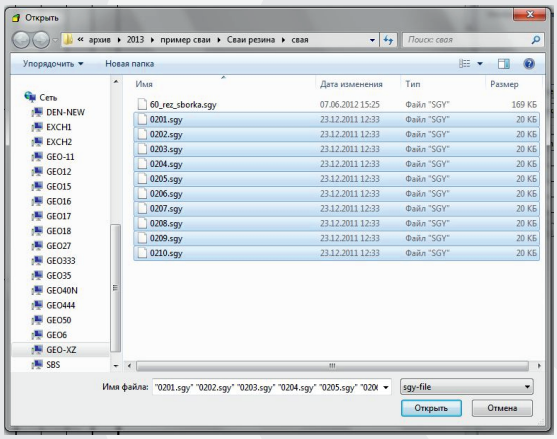
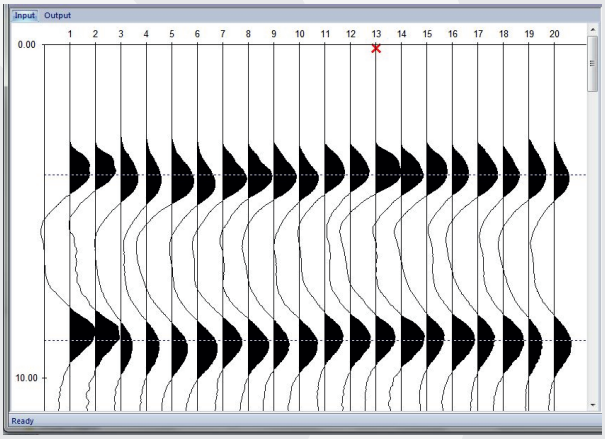
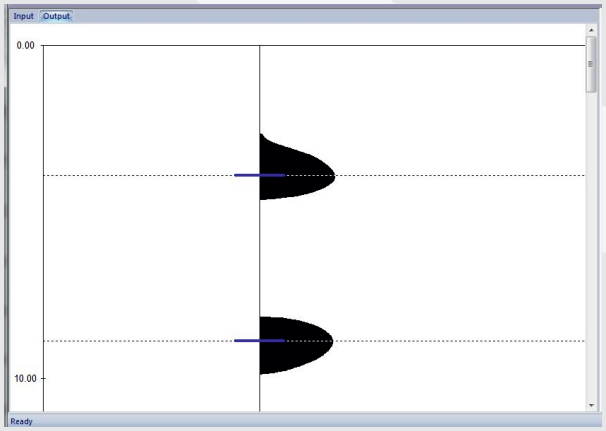


the results of pile surveying

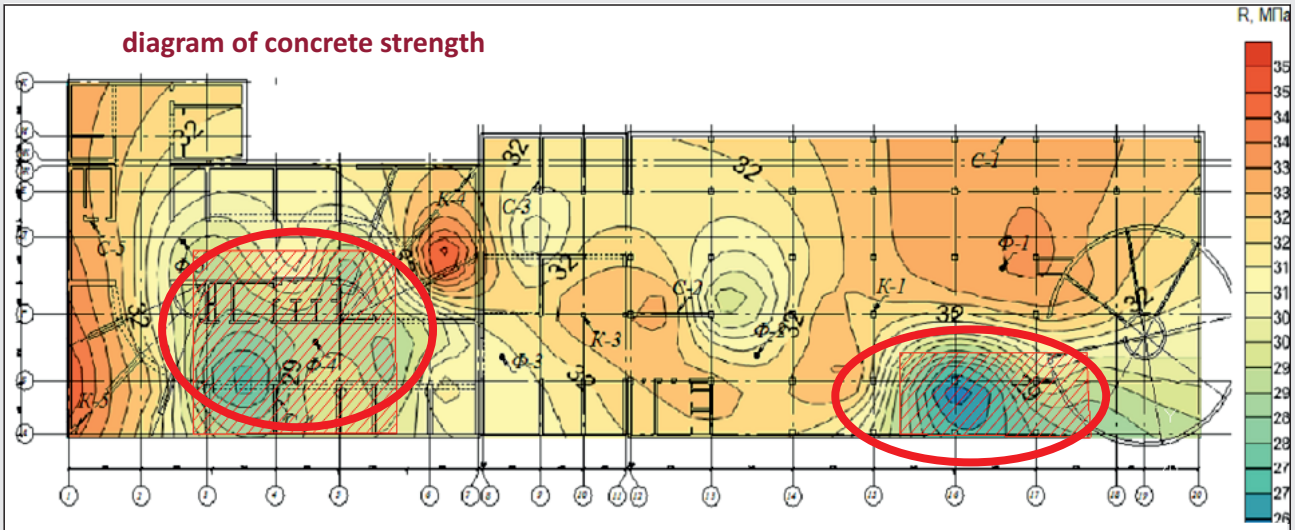


results preprocessing, scrapping of noisy traces



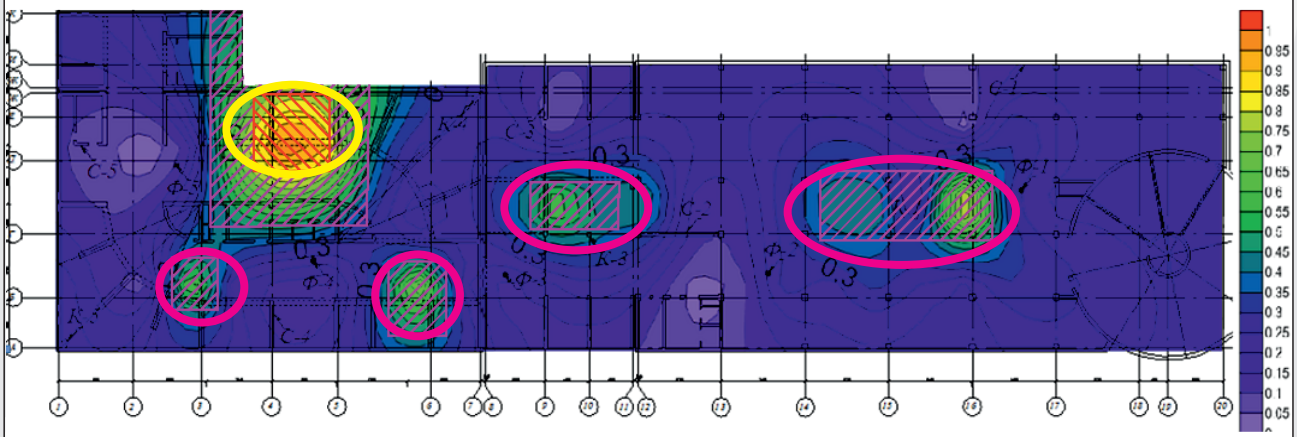
The software is used for automotive basic plates thickness, possible defects detection, survey the plate and soil engagement condition.

diagram of concrete strength



low-strength areas

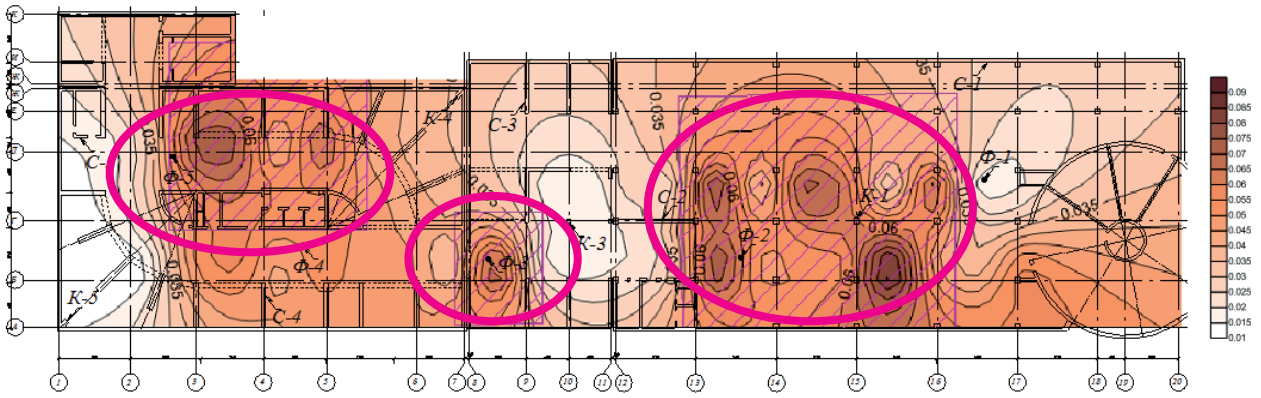
map of normalized spectral resonance amplitudes



area of disturbed contact with ground base

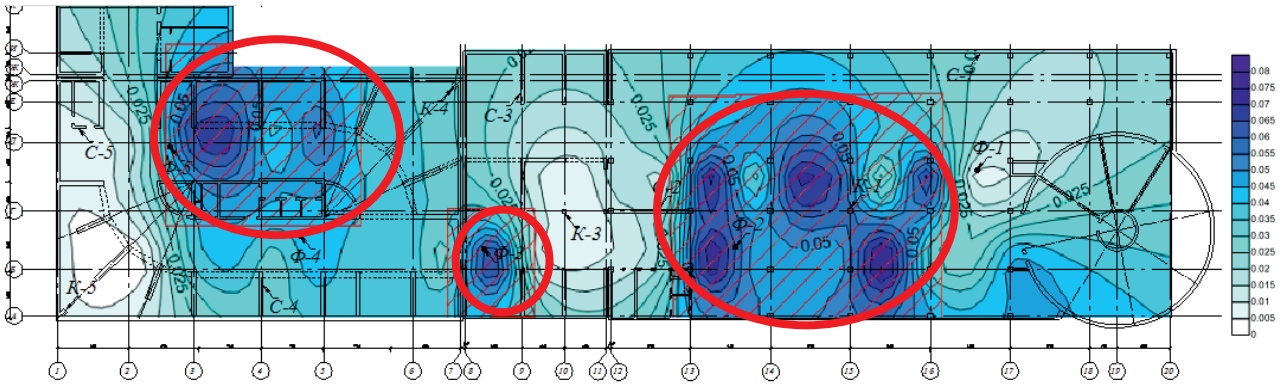
area of impaired contact with the ground base

Map of the volume fraction of voids



increased fissuring areas

Map of the volume fraction water-filled voids



water-filled areas

MORE INFORMATION
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