



COMPANY PROFILE



WE FOCUS ON RESOLVING COMPLEXED PROBLEMS

WE ARE A **100% LOCAL BASED COMPANY** WITH OFFICES IN AKTAU ,
ATYRAU, ALMATY, MOSCOW, TENGIZ.

WE ARE AFFILIATED AND CONNECTED WITH DIGITLIZED TECHNOLOGY DRIVEN COMPANIES THAT CAN
OFFER AUTOMATION PROCESSES, SIMULATIONS & ROAD TRAFFIC MANAGEMENT SYSTEMS.

WE TRANSFORM BUSINESS ACTIVITIES TO DIGITAL FORMAT FOR EXAMPLE WE CATER FOR ASPALT
SCANNING OF ROADS AND AIRFIELD SURFACES IN LINE WITH INTERNATIONAL STANDARDS.

WE MANAGE THE ABOVE TECHNOLOGIES TOGETHER with CIVIL & ELECTRICAL E&I,
(EPCM) CONTRACTS IN LINE WITH (PMBOK).

WE UTILIZE SKILLED PERSONNEL THAT ARE ALWAYS READY TO SCRUTINIZE, EVALUATE and SUBMIT BEST
SOLUTIONS TO CLIENT EXPECTATIONS

Within Clients Expectations meaning 1. TIME 2. Within BUDGET 3. To SPESIFICATIONS.

COMPANY PROFILE



DESC MANAGEMENT SPECIALISED IN :

- 1. AIRPORT RUNWAYS STRIP & SURFACE DIAGNOSTIC X-RAY SURFACE INSPECTIONS.**
- 2. ROAD TRAFFIC SOLUTIONS with MOBILE ROAD LABORATORY**
- 3. HSE , PROBLEM SOLVING SOLUTIONS.**
- 4. SECURITY SYSTEMS CAN BE SIMULATED & ADDRESSED WITH LIMITED RISK OUTCOME**
- 5. CONFLICT SITUATIONS (People Management / Vehicle Management) – SOFTWARE PRODUCTS**
- 6. MODELING OF TRAFFIC MANAGEMENT SYSTEM**
 - **SOFTWARE SIMULATION WITH OUR “A+C TRANSPROEKT” SOFTWARE DEVELOPMENT CENTER**
- 7. GEOGRAFICAL COORDINATES , METROLOGY, STANDARTIZATION AND CERTIFICATION OF ALL SURFACES FOR BOTH AIRPORTS & ROADS**
- 8. ELECTRICAL E&I INSTALLATIONS (Including Telecommunication Installations & FIBRE OPTIC)**
 - **HIGH REFLECTIVE ROAD SIGNAGE BOARDS – Remote Electronic Display Boards etc.**

EVALUATION AND INSPECTION OF RUNWAY CONDITION AND OTHER SURFACE AREAS OF AIRPORT FOR TENGIZ AIRPORT



PREVIOUS EXPERIENCE IDENTIFIED THE FOLLOWING SAFETY

NEEDS :

- **NORMALLY A LACK OF UNINTERRUPTED AND COST-EFFECTIVE OPERATION OF THE RUNWAY AND TAXI OF PLANES , PARKING BAYS INFRASTRUCTURE. (RISKS OF UNDERGROUND DAMAGES TO SURFACE CONCRETE AND ASPALT LAYERS MIGHT EXIST.)**
- **WE ARE CONCERNED THAT NO PROFESSIONAL APPROACH FOR INSPECTION AND DIAGNOSTICS OF ROAD SURFACES FOR THE TENGIZ AIRPORT RUNWAYS EXIST. (We can provide such Service).**
- **SAFETY REQUIREMENT FOR AIRPORT OPERATIONS - ALLOW US TO UTILISE OUR MOBILE LABORATORY TO CARRY OUT THESE TESTS, WITH ANNUAL CERTIFICATION COMPLIANCE.**
- **OPTIMIZATION OF MAINTENANCE PLANNING.(LETS REVIEW AND MANAGE IT FOR YOU)**
- **REDUCTION OF MAINTENANCE COSTS AND RISKS OF POTENTIAL AIRCRAFT ACCIDENTS.**
- **IDENTIFICATION of RUNWAY SURFACE DEFECTS THAT REQUIRE CORRECTIVE MAINTENANCE.**
- **We can Provide : Preventative and Corrective Maintenance support.**

INSPECTION AND DIAGNOSTICS OF ROAD CONDITION

THIS is one of the MOBILE X-RAY VEHICLES



OUR EQUIPMENT COMPLY TO INTERNATIONAL STANDARDS DIN 40050 / NE 60529/ IEC 529, GOST 32729-2014

Aircraft Sliding out of Control



AIRPORT DANGERS

➤ To ensure aircraft wheels can garner maximum friction when wet and to prevent aquaplaning, the surfaces are often grooved to provide grip and allow water to run off. (to prevent LOSS OF TRACTION)

➤ One such airport official said to have suffered from standing water, one of the terminal's aircraft, has said is sinking. (Unforeseen Surprise)

➤ SURFACE AREAS needs regular inspection and maintenance to ensure they remain free from cracks, holes and general wear and tear.

The routine jobs required by runways

Removing residual rubber

Cleaning approach Airport lights

Re-painting markings

Evaluating surface integrity for CRACKS / Potholes / Uneven Surfaces (Diagnostic Scanning of Layers below the Surface)

Checking for foreign objects

Repairing cracks and resealing joints, Perform Annual Diagnostics Inspections to identify all Risks Areas of pavement areas. (Obtain Annual Certification of Tests Carried out)

Cutting grass around the runway – Check for Birds etc.

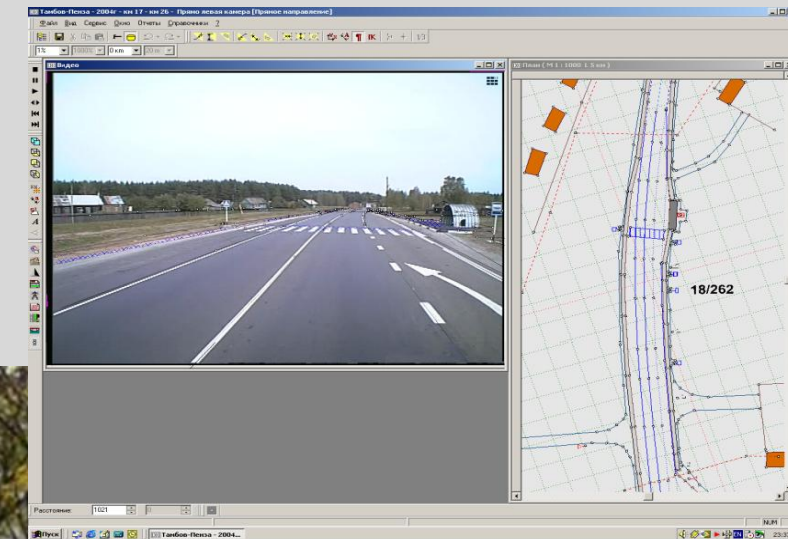
Ensuring water run-off paths are clear

Areas with SOFT SOIL and CONCRETE or ASPHALT Surfaces should be regular inspected and Certified checked and Inspected before and after Maintenance Repairs been carried out. Uneven surfaces of Runways can cause unsafe conditions. Cracks can cause tire damage to planes with catastrophic outcome.

ROBOTIC ROAD UNITS AND MOBILE LASER SCANNING THE ROAD MAINTENANCE PLANNING



- **IDENTIFICATION OF DEFECTED AREAS TO BE PREPARED .**
 - **OFFICE PROCESSING AND INFORMATION STORAGE in GRAFICAL FORMAT**
 - **(On the Surface and non visible underground layers.)**
 - **SEROUNDING ROADS REPORT OF THE ROAD CONDITIONS.**
 - **IDENTIFICATION OF ROAD SECTIONS TOBE REPAIRED.**
 - **INSPECTION OF THE PAVEMENT LAYER AND SUBGRADE TOP CONDITION**
 - **USE OF GPR TO REFINE THE PAVEMENT DESIGN**
(Ground Penetration RADAR SYSTEM)
 - **ESTIMATION OF THE PAVEMENT ELASTI' CITY**
 - **EVENNESS EVALUATION OF LANDING STRIP or Road Surface.**
 - **IMMEDIATE SCANNING REPORTS PROVIDED WITH GEOSCANNERS. (BEFORE AND AFTER REPAIRS)**
- OUR MOBILE LABORATORY can provide all reports with clear GPS coordinates.**



Road LABORATORY CONSIST OUT OF :

A. Positioning system:

1. Odometer
2. Internal navigation system
3. GPS/GLONASS satellite receiver

GLONASS = Global Satellite Navigation System

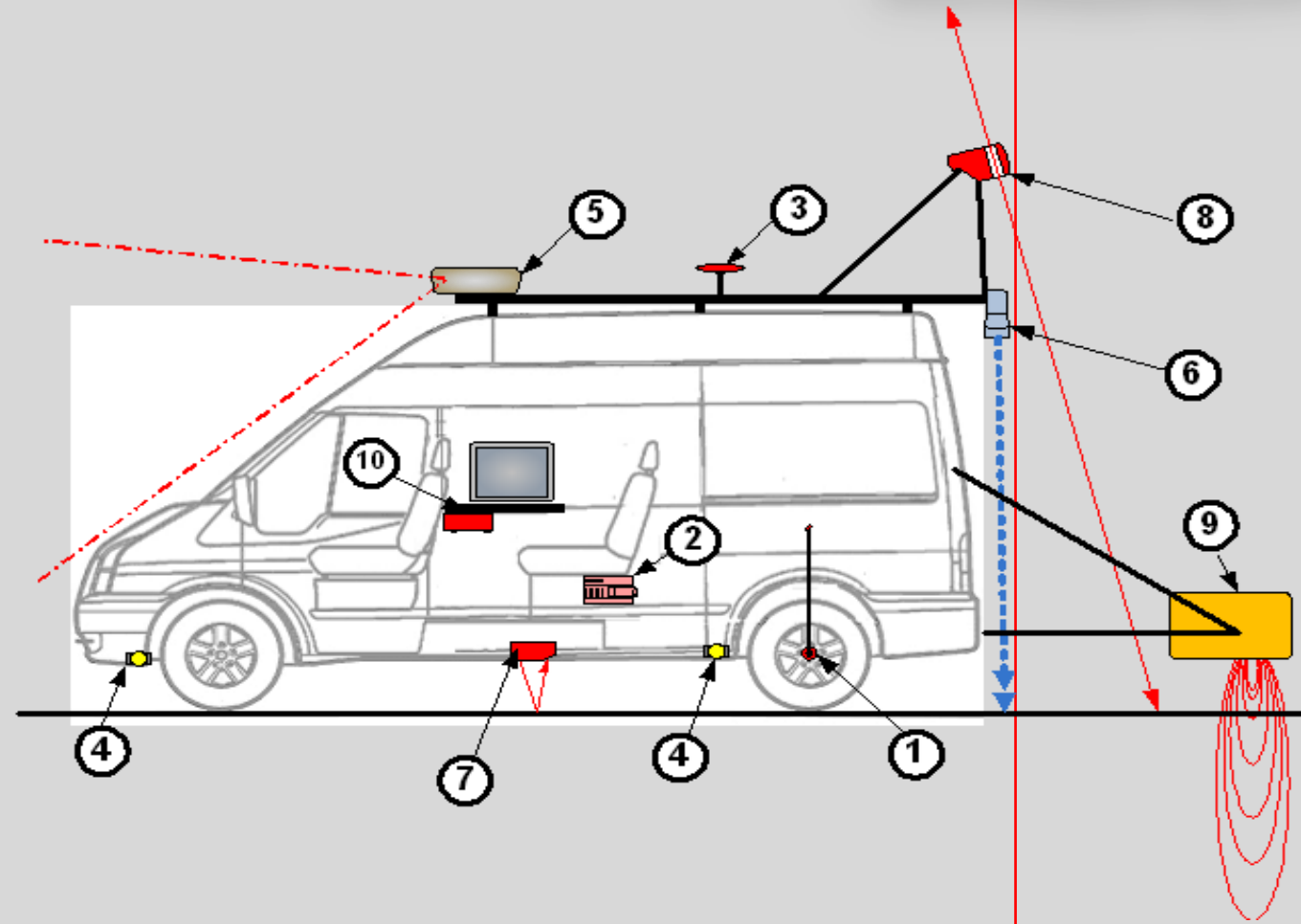
4. Base platform position sensors

B. Video measuring system

5. Digital camcorders
6. Line cameras

C. Road data collection sensors

7. Profilo'meter
(measures surface flatness)
8. Laser scanner
9. Georadar with horn antenna unit
(Underground Ground Penetrating Radar)
10. RUT recorder
(Data Recorder with remote storage)



**THE 4 MAIN TESTS and MEASUREMENTS THAT WILL BE CARRIED OUT ON THE AIRFIELD PAVEMENTS
& RUNWAYS**



- 1. (1. Measurement and Analyses of Runway layers' Strength characteristic's- bearing capacity of the structure.)**
- 2. (*2Measurement and Assessment of pavement thickness)**
- 3. (*3)Inspection of Longitudinal and transverse pavement evenness by ultrasonic profilometer**
- 4. (*4) Inspection of Airport pavement, structural layers and base course**

Inspections is carried out by the multifunctional mobile laboratory equipped with the following :

- a. Video filming complex with digital recording, which allows you to automatically record damage and track their development over time.**
- b. Positioning system for a navigation system based on gyroscopes , a GPS satellite receiver, ultrasonic position sensors and distance sensor.**
- c. An ultrasonic profilometer designed to record the longitudinal and transverse evenness of the pavement consisting of three transverse measuring beams with ultrasonic sensors mounted on them, each of which determines the distance to the pavement surface , and measures elevation every 25cm.**
- d. Laser scanner, used for recording parameters of the runway cross-section and trenches and topography of leveled part of air field.**
- e. Ground Penetrating radar used for inspection of airport pavement, structural layers and base course. Identifying the water saturated and softened soil zones, as well as fixed and continually moving site and underground water tables. Identifying impact between Winter & Summer movements of soil.**

PART of the Mobile Microbus Laboratory EQUIPMENT

(Not all devices is listed)



1. Mobile Microbus with Manned On Board Computer workstation
2. Control Units (Data Collector that record Real Time with Date / Time / GPS Navigation / GPR – Ground Penetration Radar System. **(1. Measurement and Analyses of Runway layers' Strength characteristic's- bearing capacity of the structure.)**)
3. Synchronization system from scanners and laboratory equipment while in transit.
4. Inertial Navigation System : **Digital Gyroscope** (Device which is itself free to alter in direction – it is used for navigation systems , automated pilots and stabilizers.)
5. Digital accelerometer
6. Digital pressure sensors.
7. 10 Hz Satellite Receiver
8. Digital Video Cameras scanning all directions and underneath vehicle (1 frame per meter)
9. RUT Depth Recorder: with accuracy of 1-2mm with working width of 4-5 m , Protection IP66/IP67 (DEVICE USE TO IDENTIFY ROAD ROUGHNESS & DEPTH **MEASUREMENT (*2Measurement and Assessment of pavement thickness)**)
10. SVPD Laboratory data Office processor software (MEASURE SATURATION OF UNDERWATER /SOIL FORMATIONS
11. GPS / GLONASS Antenna (GLONASS is a global navigation system)
12. Mobile Laser Scanning penetrating Radar up to 6m depth.
13. Set of software systems
14. GPR & DIP Impulse -03/04 deflection dynamic gauge unit. (GPR –Ground Penetrating Radar) (Weight /Strength Measurement)
15. Many more high-tech devices and printers.

INSPECTION AND DIAGNOSTICS OF AIRPORT RUNWAY CONDITION – METHODS

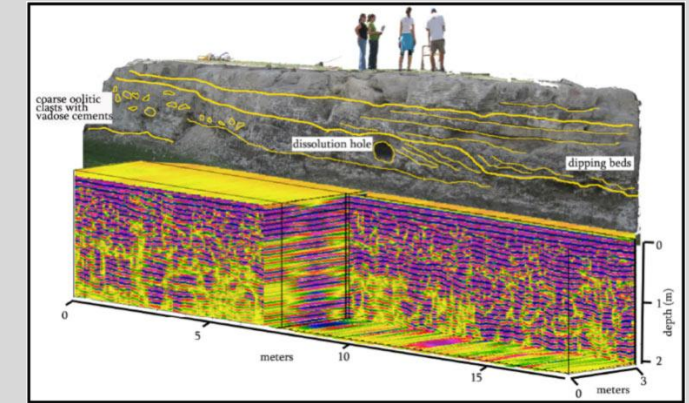


GPR SURVEY OF AERODROME 3 D MODULAR SURFACE WITH CORE SAMPLING (PUNCHING)

(GPR – GROUND PENETRATION RADAR)

Carried out by 2 types of antennas:

- 2500 MHz central frequency, sounding depth up to 0.4 m, resolution 0.5 cm
- 400 MHz central frequency, sounding depth up to 0.4 m, resolution 15 cm
- IDENTIFICATION of paving layer thickness
- **(*4) Inspection of Airport pavement, structural layers and base course**



ASSESSMENT OF AIRPORT RUNWAY SURFACE EVENNESS

- Made in accordance with GOST R 56925-2016 “Automobile roads and airfields

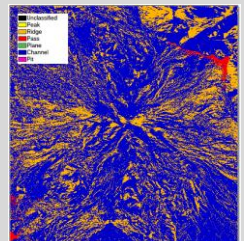
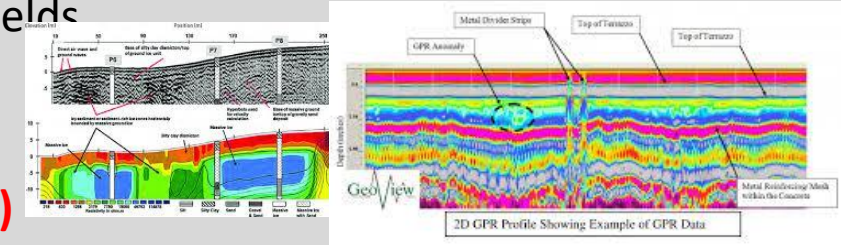
GOST R are the national standards of the Russian Federation and CIS countries. ... GOST R 56925-2016.

Automobile roads and airfields. Unevenness.

- Unevenness measurement methods for base courses and pavements”.
- Carried out with road **Pofilometer**. **(IDENTIFICATION OF DEFORMATIONS)**

(*3) Inspection of Longitudinal and transverse pavement evenness by ultrasonic profilometer

- **TOPO’GRAFIC PLAN of ARTIFICIAL Runway with Markings of Roadbed**
- Saturation in Sectional Defined Areas (Clearly indicating all Problems and or Satisfactory Status per 1m2 sectional area.
- Longitude and cross –section of Runway taxi- lanes of planes with scanned sectional surface reports, indicating cracks, soil and water saturation in specified areas of concern.



BELOW SURFACE LAYER SCANNING OF ALL SURFACE AREAS



DEFORMATIONS .

1. ASSESSMENT OF GEOMETRIC PARAMETERS AND DETECTION OF DEFECTS IN THE RUNWAY

- Determination of all geometric parameters of the airport runway and surface areas.
- Determination of exact coverage areas and referencing of objects to WGS-84 (**World geographical coordination system**); accuracy no worse than 10 cm (Internal Coordinate system of a map or Aerial Photo Image) . (**DESIGN STATUS vs ACTUAL STATUS**) of the RUNWAYS .
- Recognition (digitalization) of visible defects in coating (**cracks**, potholes, joints, **deformations**, repair cards, local draw-downs etc.); accuracy no worse than 10 cm
- Determination of the real geometric dimensions and their binding to WGS-84; accuracy no worse than 10 cm **The Global Positioning System uses the World Geo'detic System (WGS84) as its reference coordinate system.**

INSPECTION AND DIAGNOSTICS OF AERODROME RUNWAY CONDITION IN TENGIZ

2. RUNWAY STRENGTH ASSESSMENT

- Made in accordance with GOST 32729-2014 IRI “The method of measuring elastic deflection to determine the strength of non-rigid pavement”. IRI – INTERNATIONAL ROUGHNESS INDEX
- Carried out with “DIP Impulse” unit – a forced impulse is sent to the pavement which can identify failing load capacity default. (synchronous measurement of the magnitude of force and deflections of the pavement). **IDENTIFICATION OF STRENGTH OF SUB SOIL SURFACE AREAS.**
- Hi-tech SOFTWARE designed for accuracy & smooth evaluation of an Entire Airfield or Road / Parking Areas.
- DENSITY OF **compacted deformations** Surface Areas that Might **be hidden beneath the surface** area that is not to standard.

AT TENGIZ the LOW WATER TABLE / SOFT SOIL / WINTER & SUMMER CONDITIONS can CHANGE OVERNIGHT THE LAYER CONDITIONS DUE TO WATER SEEPING IN BETWEEN LAYERS CAUSING DEFORMATIONS SUDDEN IMPACTED POTHOLES / --- FROM SOLID ROCK TO SOFT SOIL



REPORT GENERATION

- Explanatory REPORTS
- Cartogram of thickness of the runway coating layers
- Topographic plan of the runway with application of sub grade anomalies (voids, water logging sites, natural and manmade features etc) – A type of Map with contour lines with large scale detail – show both natural and man-made features.
- Statement of assessment of evenness of the runway coating based on the IRI evenness index and short-step leveling (amplitude) method
- Cartogram of the runway slopes (A map on which statistical information is shown in diagrammatic format)
- Statement of the runway coverage area
- Defect signal card
- List of defects
- The runway assessment statement
- Statement of assessment of the runway strength (bearing capacity)
- FUTURE REQUIRED RECTIFICATIONAL PROBLEMS

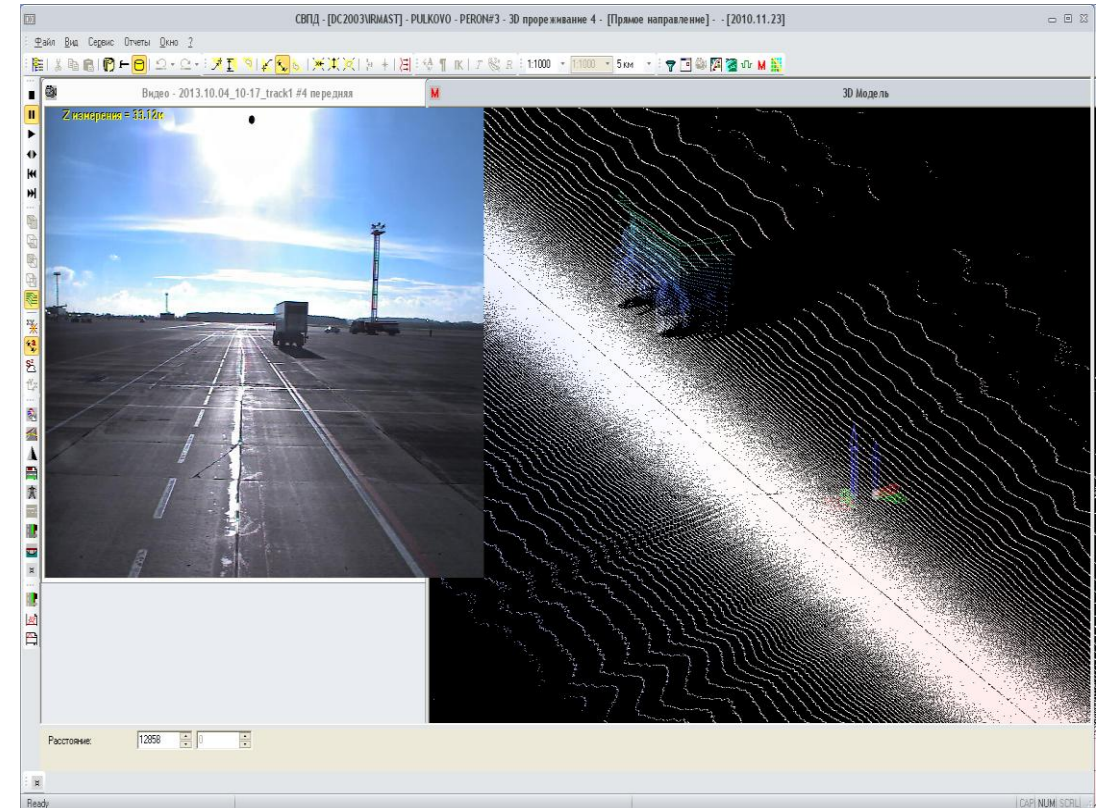
AIRFIELD MEASURING UNIT AND SOFTWARE



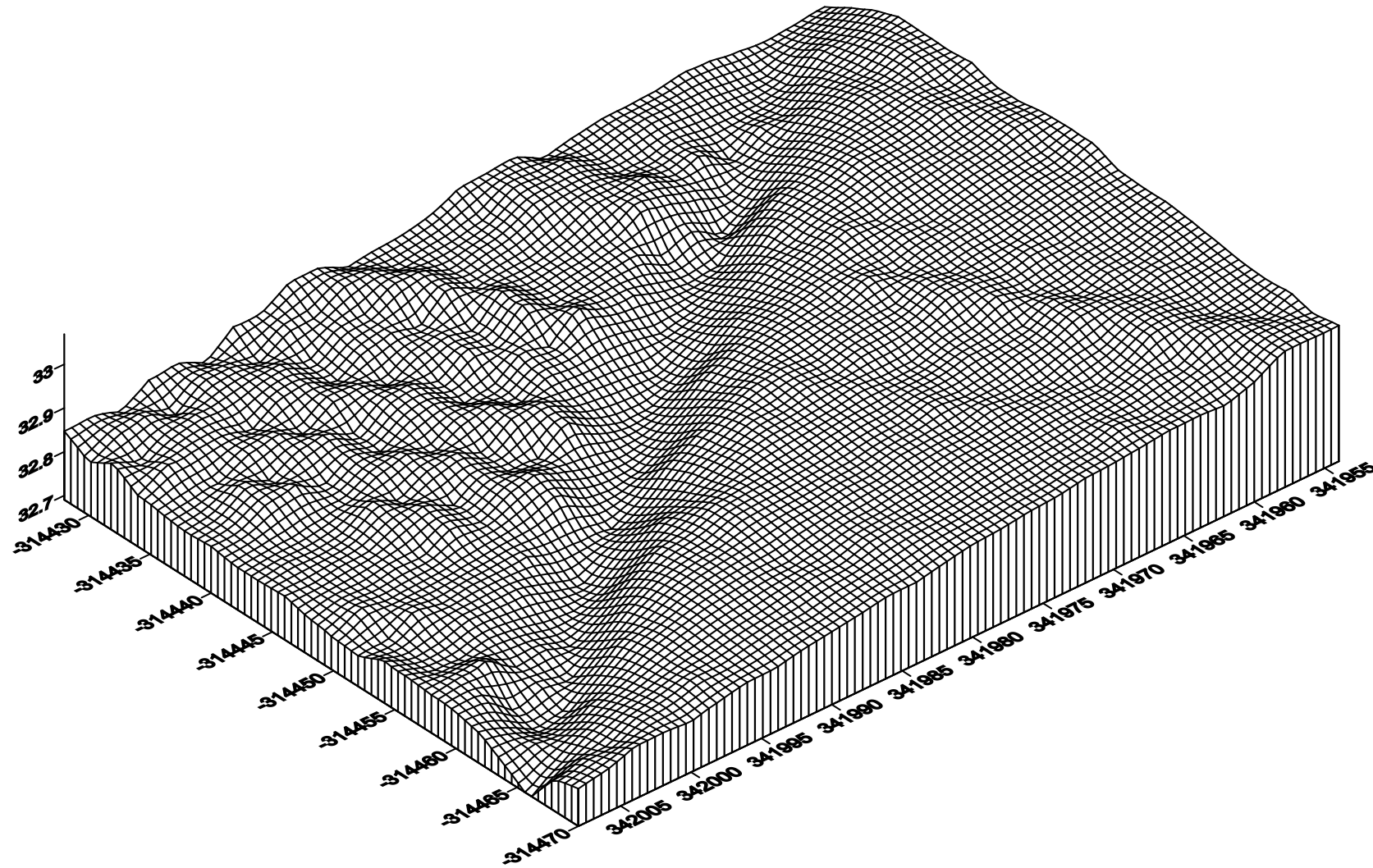
MOBILE LASER SCANNING

Scanner is designed to measure geometric parameters of the cross section and surface of the runway strip coating including transverse slopes, coatings and curbs, laying slopes and terrain relief.

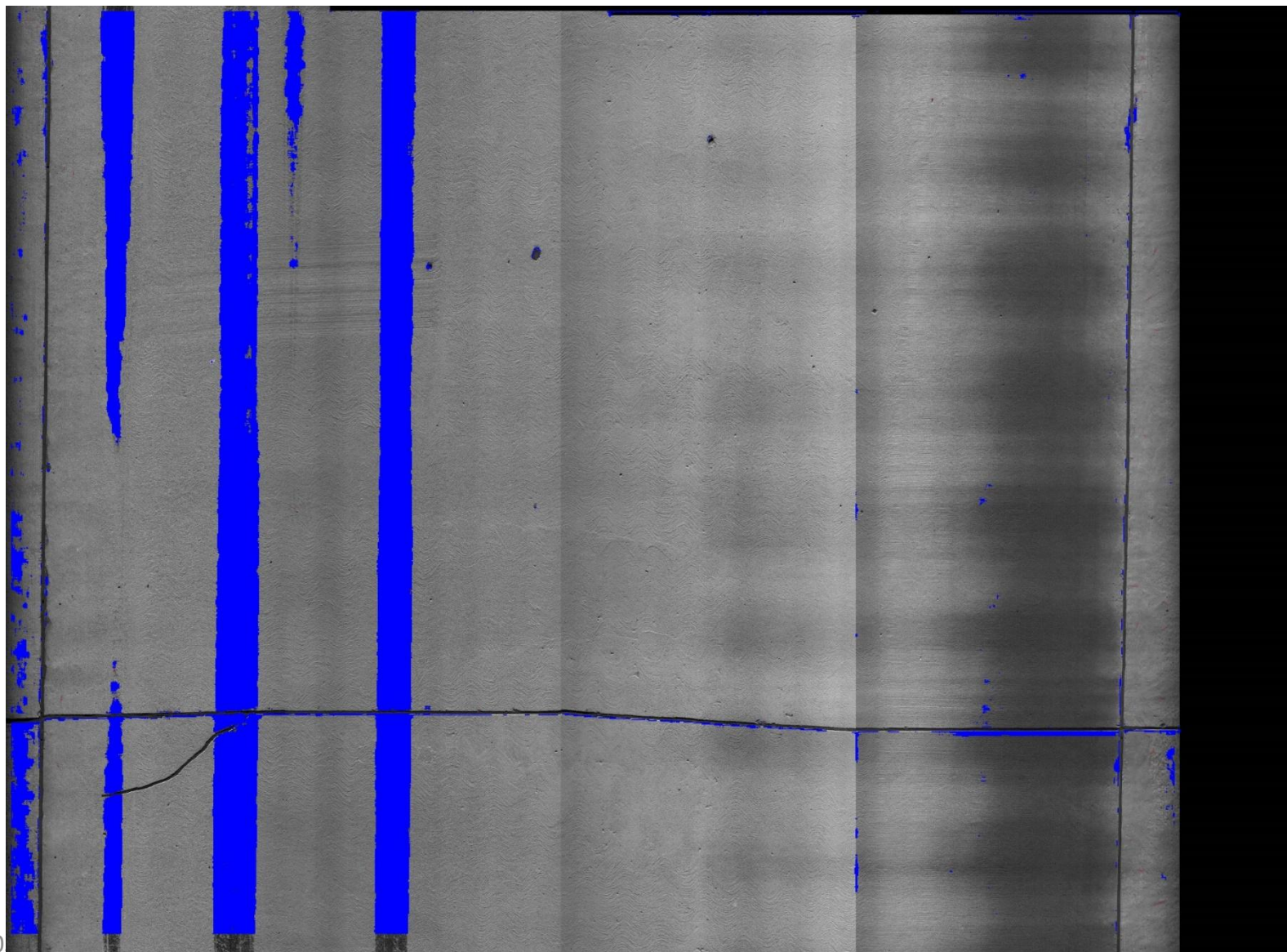
Measurement error is 5-6 mm



3D SURFACE MODEL OF APRON COVERING – EXAMPLE



AUTOMATED HIGHLIGHTING OF BRAKE TRACKS



REGISTRATION OF DEFECTS IN COATING WITH LINE CAMERAS (0.5 mm\1pix)



REFER TO OUR REPAIR REPORT SEPARATE
PRESENTATION SHOWING REPAIRING OF
IDENTIFIED DAMAGES TO SURFACE AREAS.



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END THANK YOU.