



INFRASTRUCTURE MANAGEMENT THROUGH DIGITAL INTELLIGENCE

CUTTING EDGE TECH CHANGING THE WAY WE APPROACH
DESIGN, INSPECTION AND PLANNING



smarter and better connected

DARRYL EPSTEIN – BSc ENG (CIVIL) STRUCTURAL | PR ENG. MSAICE

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BIM
Harambee
Africa
2026

WHAT LIES BEYOND BIM

smarter and better connected

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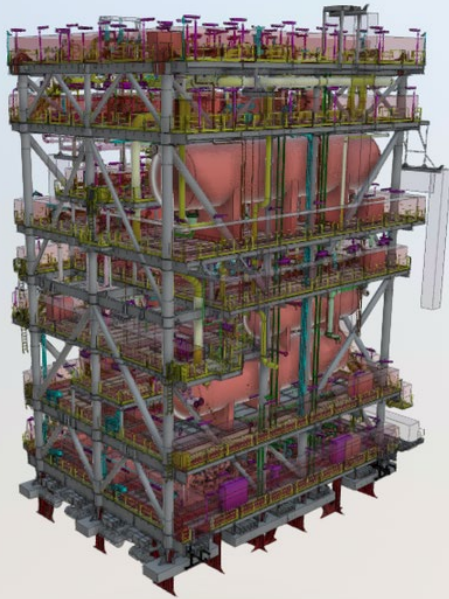
CORE PRINCIPLES IN INSPECTION, SURVEY AND DIGITISATION OF INFRASTRUCTURE

1. IDENTIFY THE **PROJECT NEEDS** – WHAT IS THE PROBLEM WE ARE TRYING TO SOLVE
2. CHOOSE THE **RIGHT TOOL SET** FOR THE JOB
3. ANALYSE AND **EXTRACT** USEFUL DATA
4. DELIVER THE **DATA & REPORTS** THAT A CLIENT CAN USE

ENGINEERING IN THE DIGITAL AGE

THE THREE PILLARS OF REALITY CAPTURE

SCAN-TO-BIM



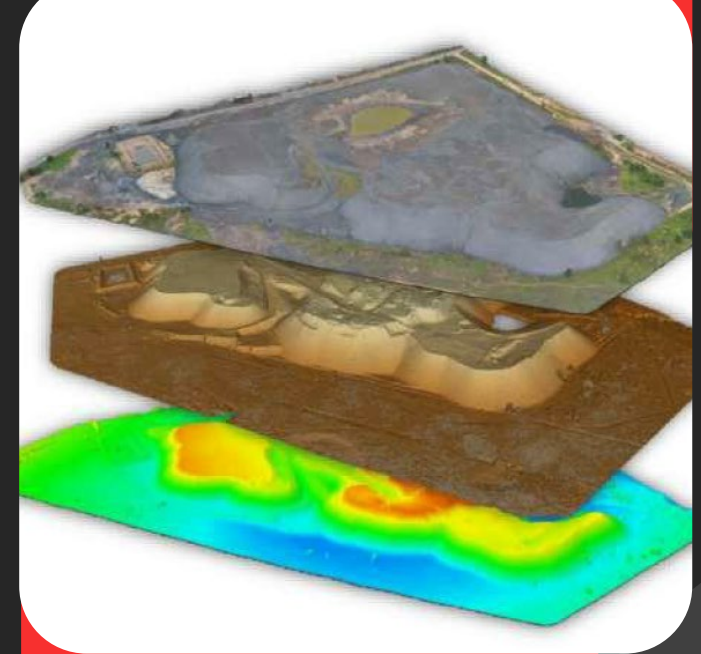
AS-BUILTS AND
3D MODELS

INSPECTIONS



STRUCTURAL AUDITS
COMPLIANCE & SAFETY

GIS



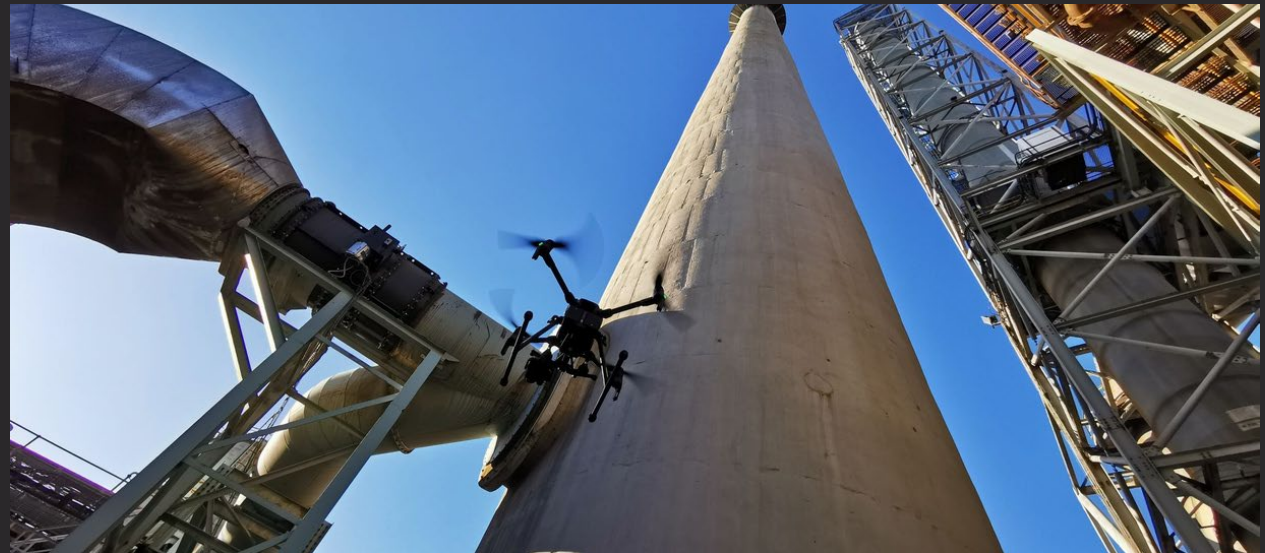
BATHYMETRY- SURVEY -
MAPPING - SITE
MONITORING

THE INDUSTRY- LEADING RECIPE

DRONE TECH

Building Digital Twins of structures to visualise, analyse, and extract engineering value.

Drones enable professionals to get to elevated spaces, confined areas, as well as cover large pieces of land



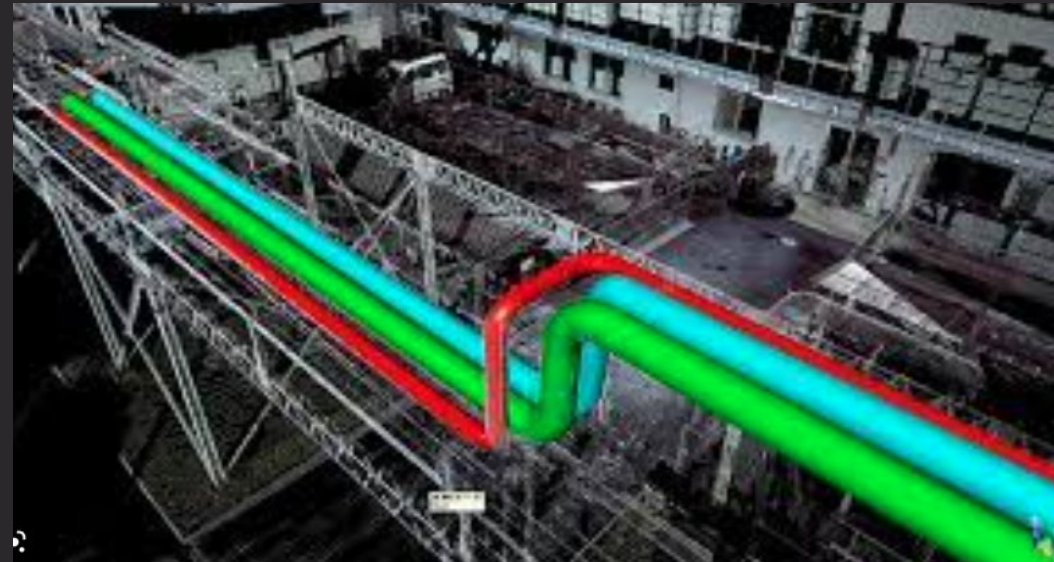
THE INDUSTRY- LEADING RECIPE



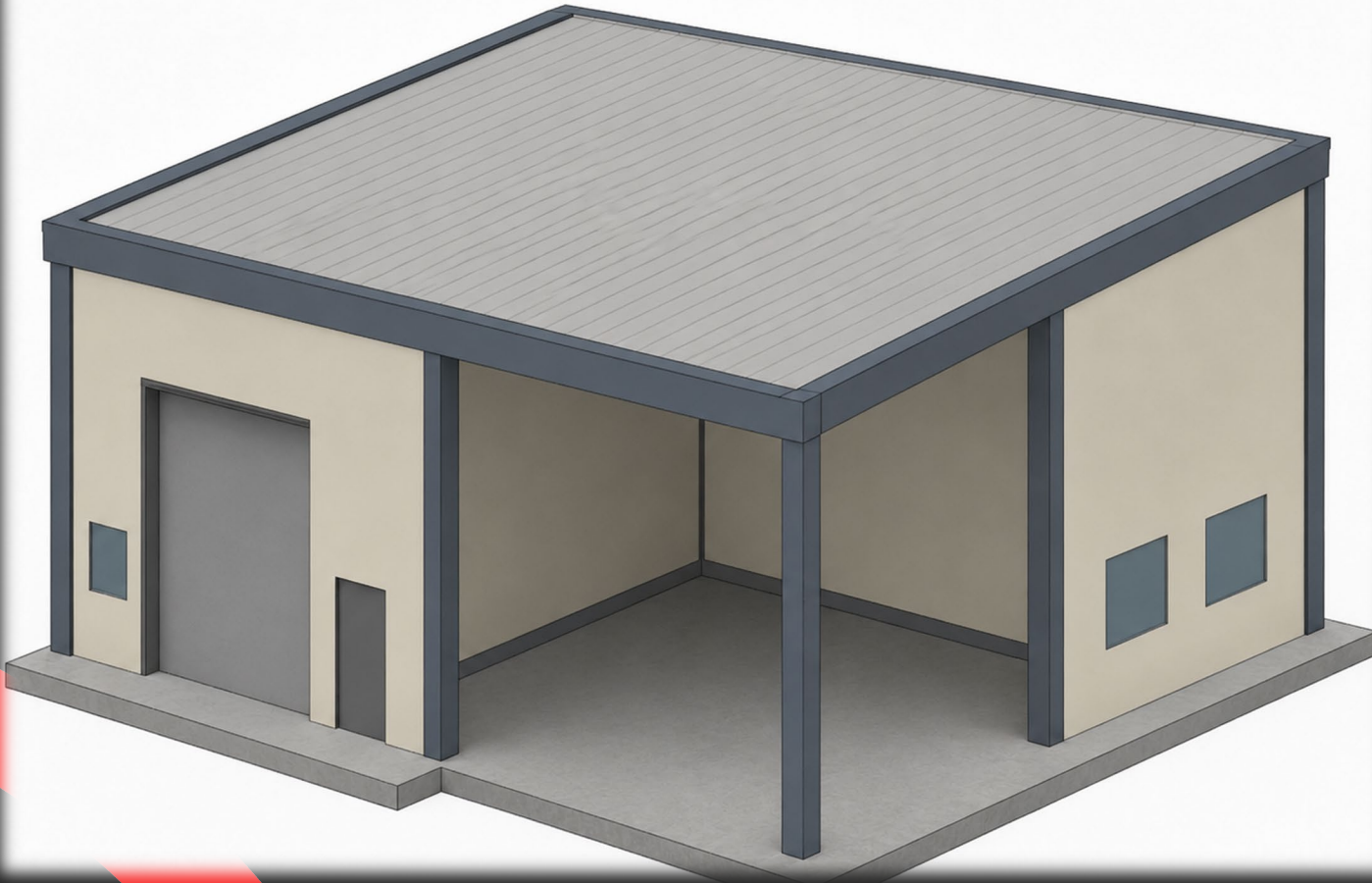
SCANNING TECH

Using high-precision laser scanners to digitise complex steel elements, tanks and structures. Creating drawings and 3D models of piping, equipment and layouts

UNDERSTANDING LOD!



WHY LODs



LEVEL OF DEVELOPMENT

LOD 100

CONCEPT



WHY LODs



LEVEL OF DEVELOPMENT

LOD 200

APPROXIMATE GEOMETRY



WHY LODs



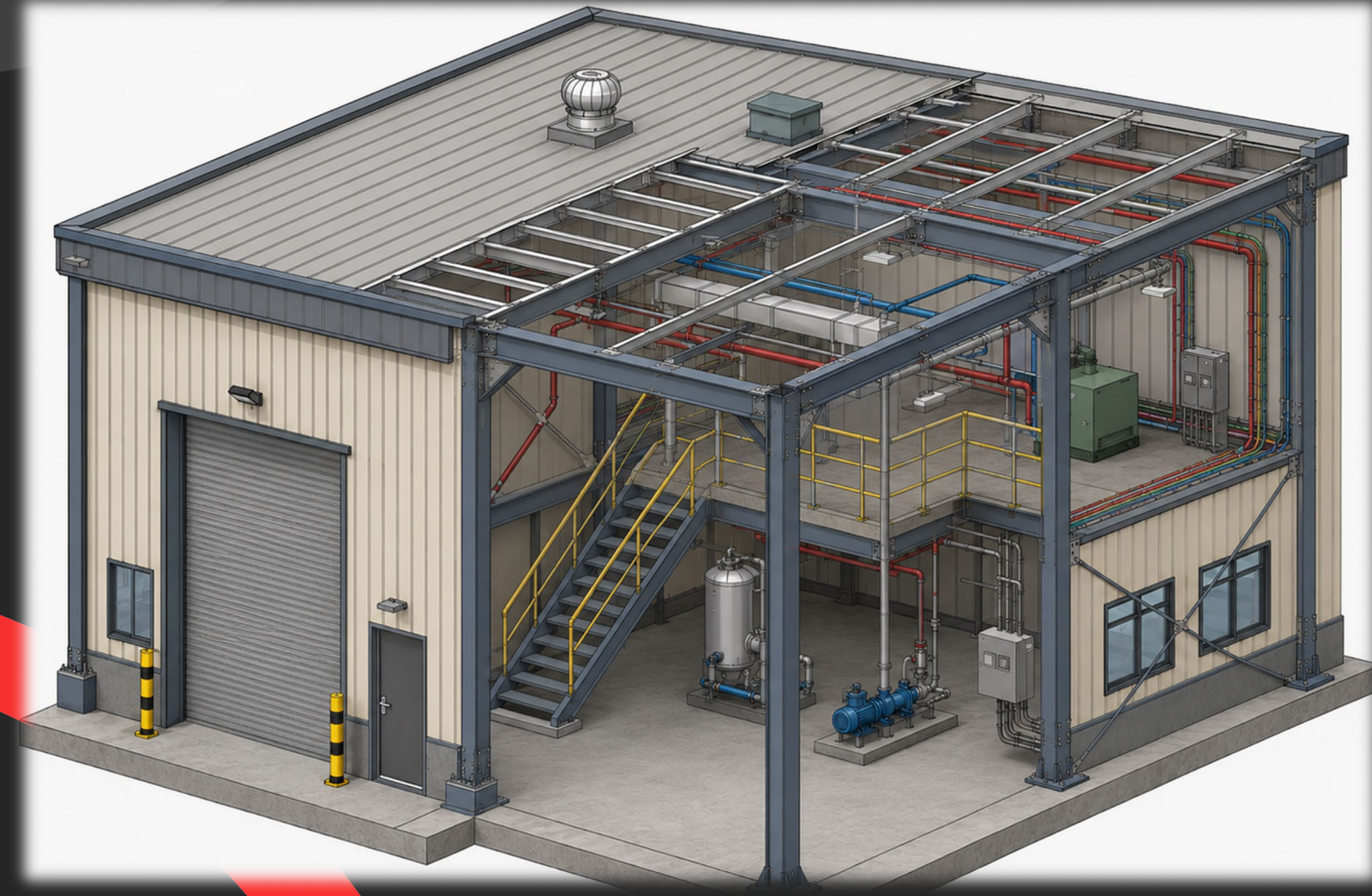
LEVEL OF DEVELOPMENT

LOD 300

ACCURATE DESIGN



WHY LODs



LEVEL OF DEVELOPMENT

LOD 350

COORDINATION



WHY LODs



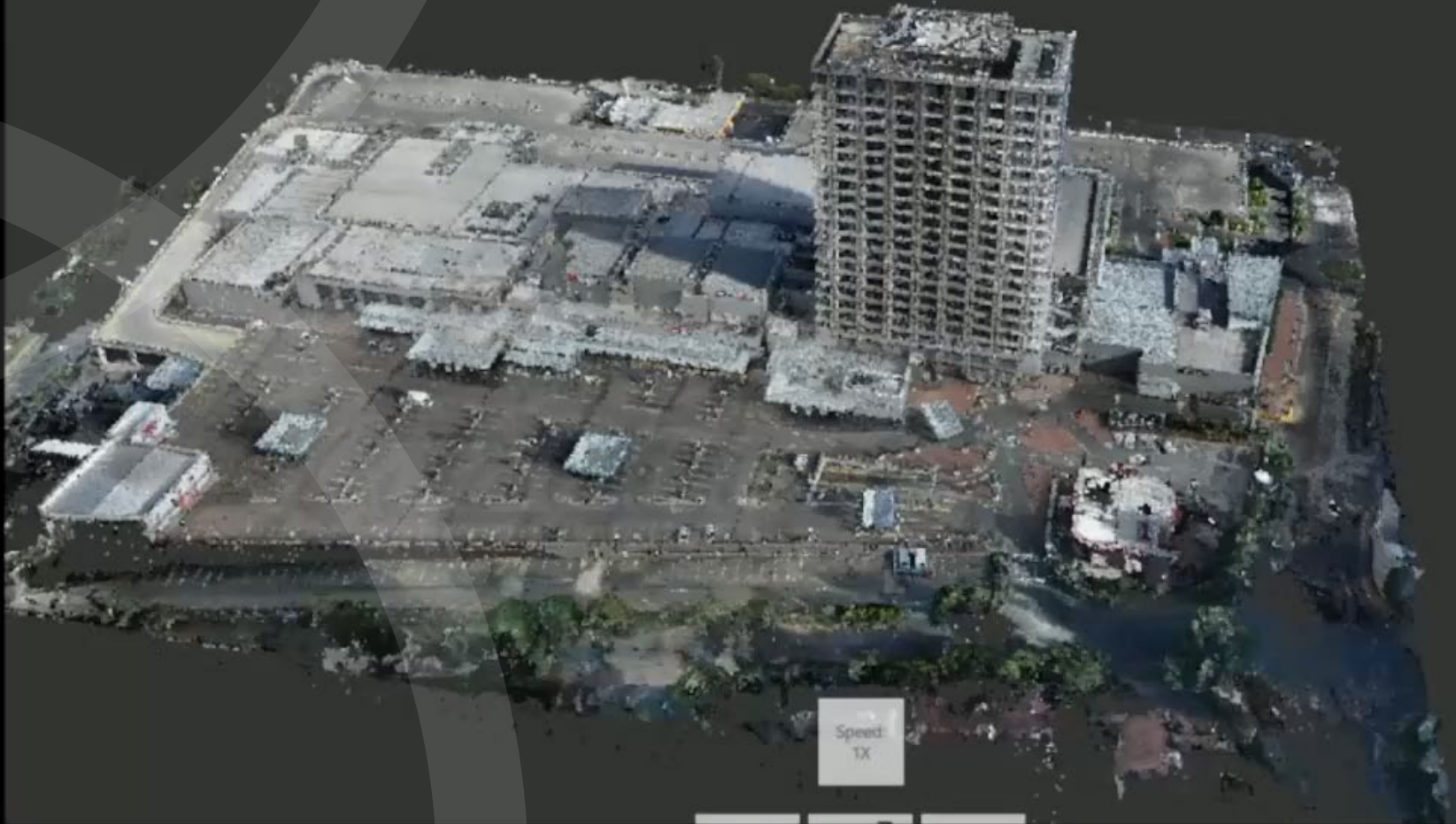
LEVEL OF DEVELOPMENT

LOD 400

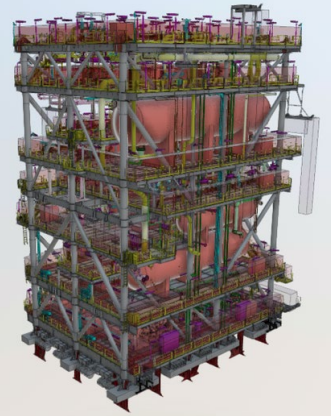
FABRICATION / HIGH DETAIL



SCAN TO BIM



SCAN-TO-BIM



AS-BUILTS AND
3D MODELS

THE INDUSTRY- LEADING RECIPE



DEEP SCANNING TECH

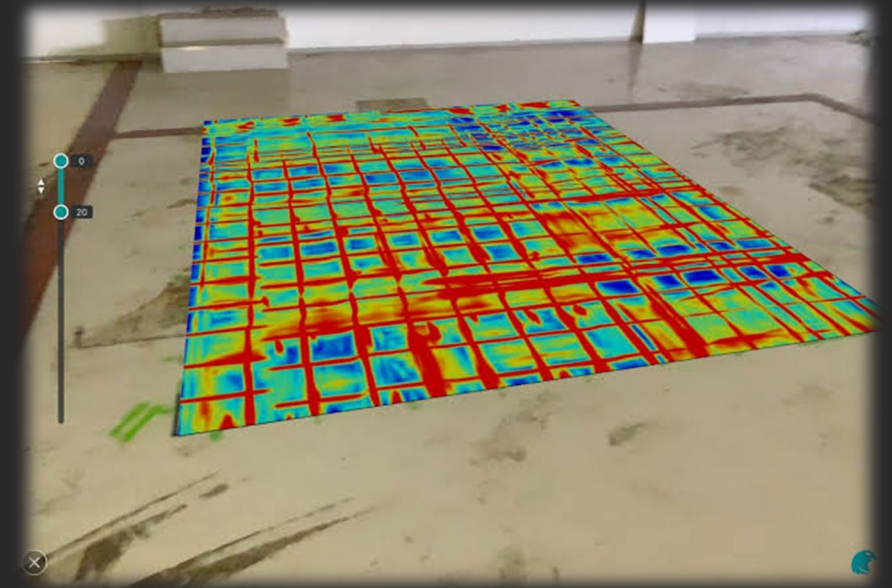
GPR for underground services detection



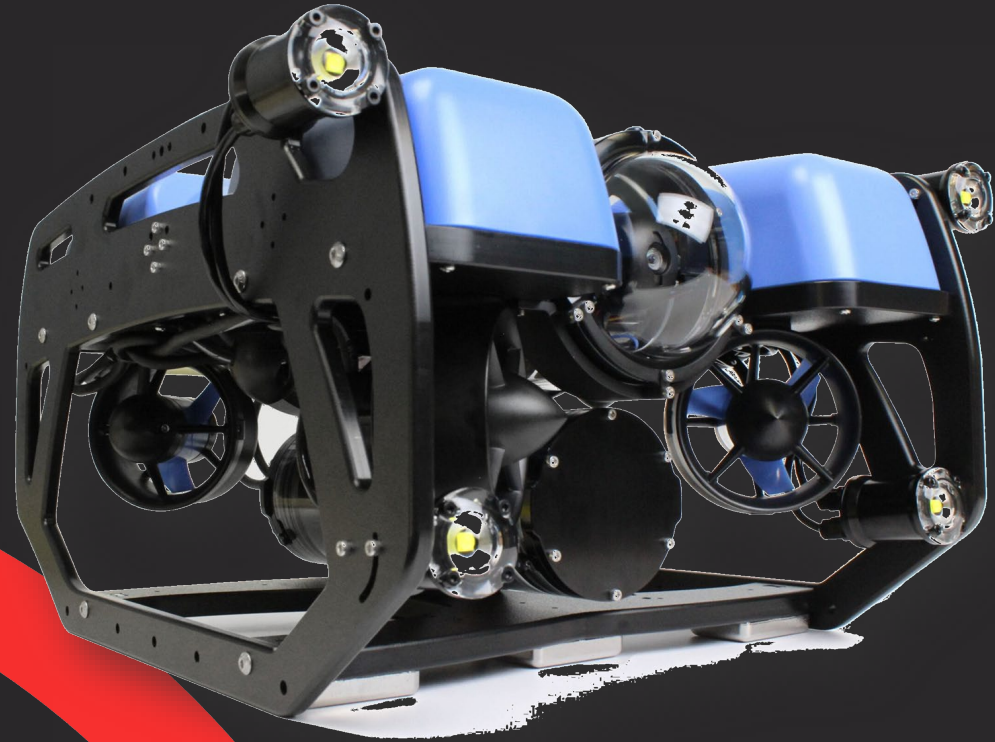
THE INDUSTRY- LEADING RECIPE

DEEP SCANNING TECH

GPR for concrete rebar mapping



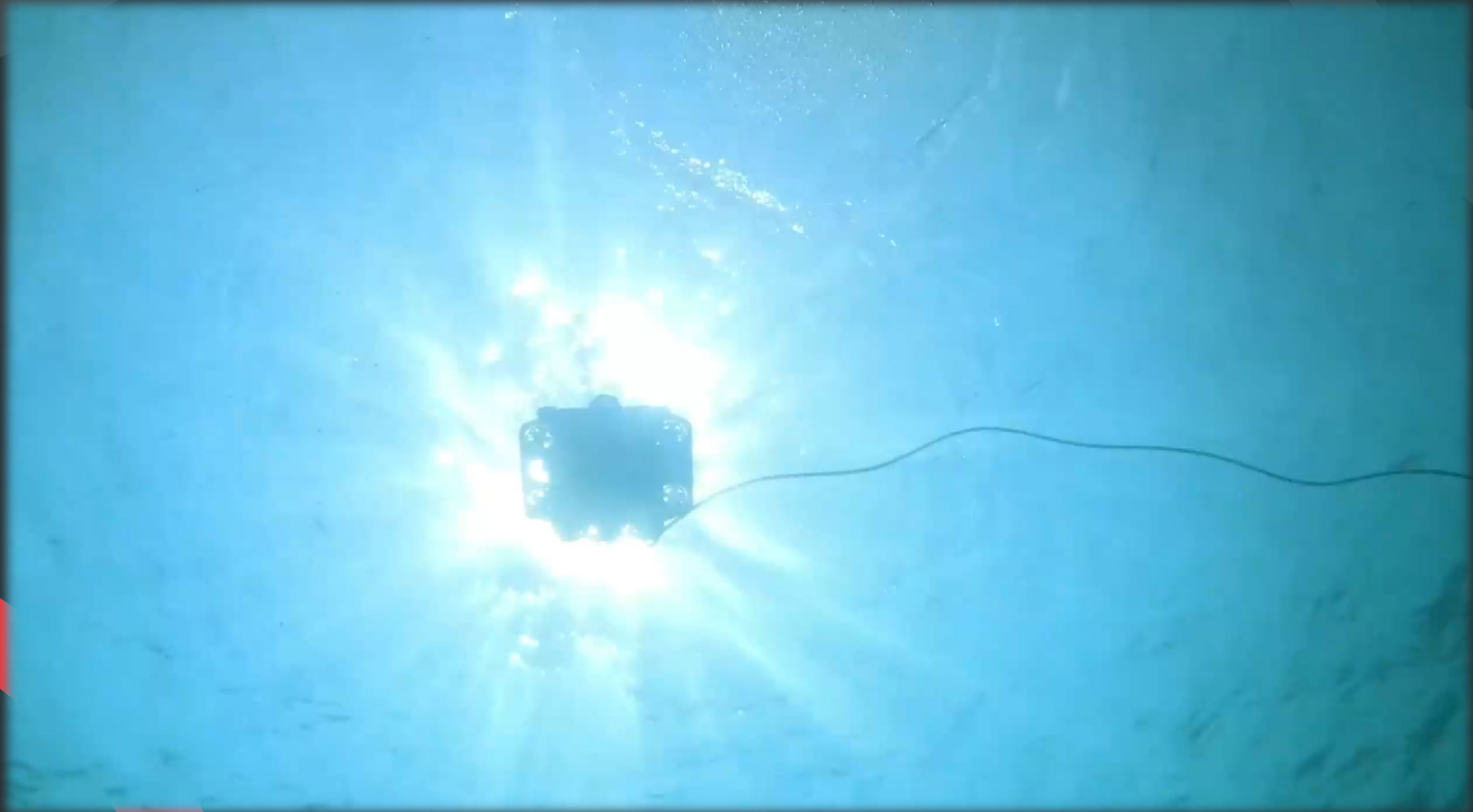
THE INDUSTRY- LEADING RECIPE



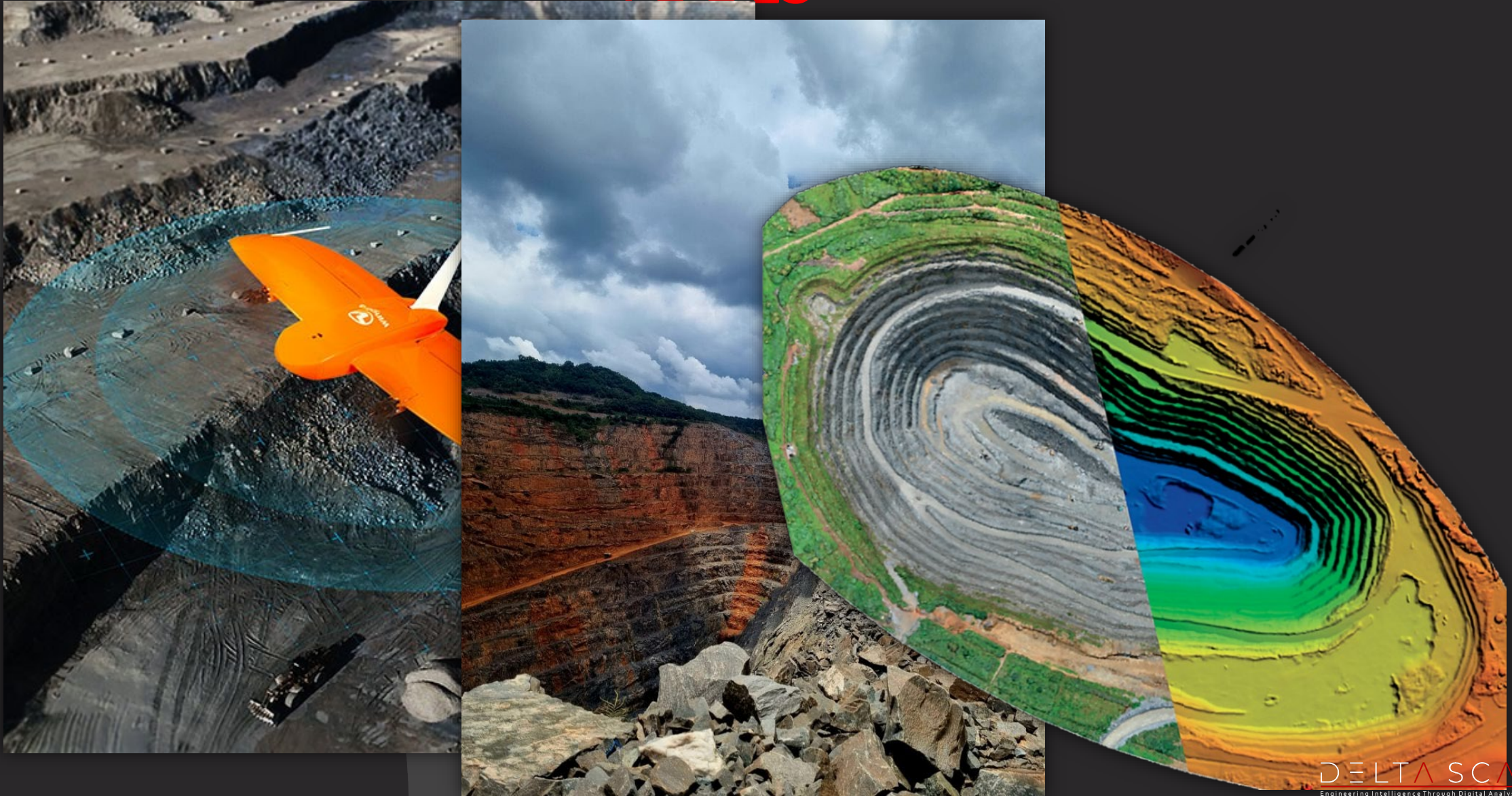
ROV SCANNING



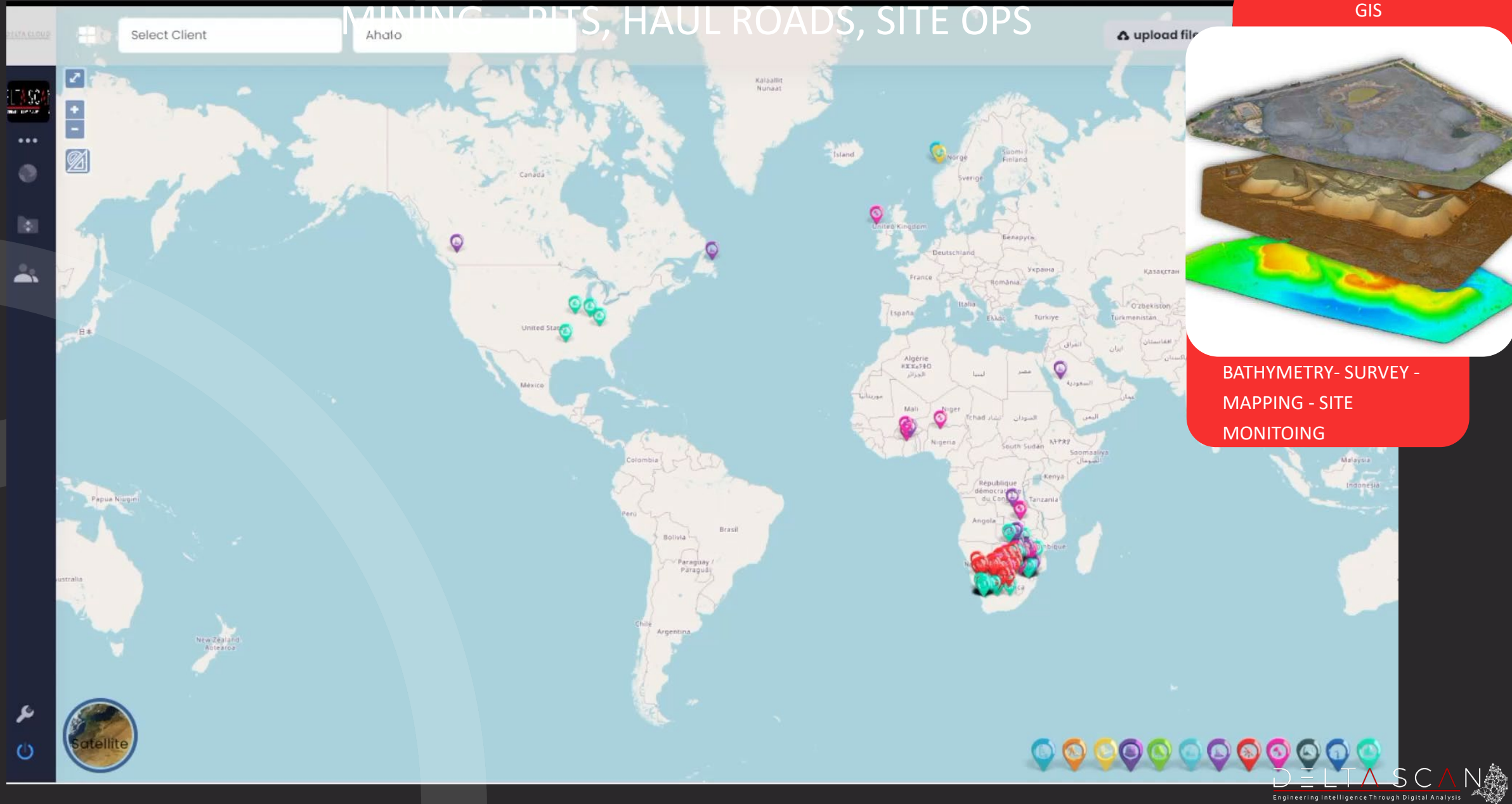
DEEP SCANNING TECH



POWERFUL SURVEY TOOLS



POWERFUL SURVEY TOOLS



INSPECTIONS

DIGITAL TECHNOLOGY DRIVING **THE RISK**
MANAGEMENT OF INFRASTRUCTURE

The Old Way of Doing Things

“WHY FIX IT IF IT AIN’T BROKE”



The Old Way of Doing Things

“WHY FIX IT IF IT AIN’T BROKE?”

- **HUGE HEALTH AND SAFETY RISKS**
- **SLOW INSPECTIONS AND LONG TIME ON SITE**
- **PLANT SHUTDOWNS REQUIRED**
- **HIGH COSTS**
- **MINIMAL VALUE THROUGH REPORTING**

INDUSTRIAL AUDITS



Loading...

Triangles: 10 million
Textures: 10.06 gigapixels
Connection Reference # 4a4df322

THERMAL AUDITS

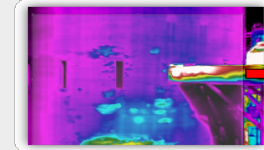
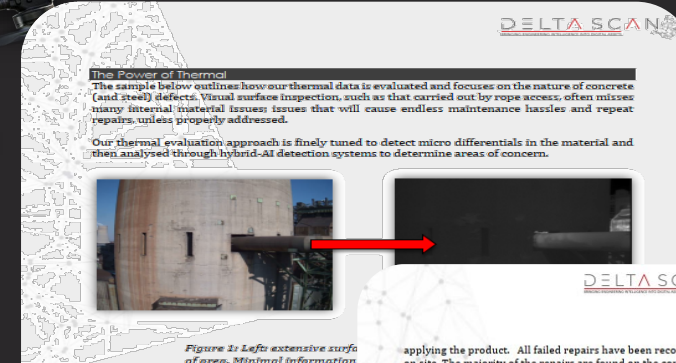


Figure 2: The same image after differential thermal analysis. Right: after noise removal

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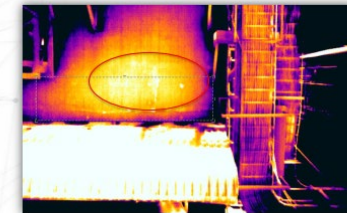
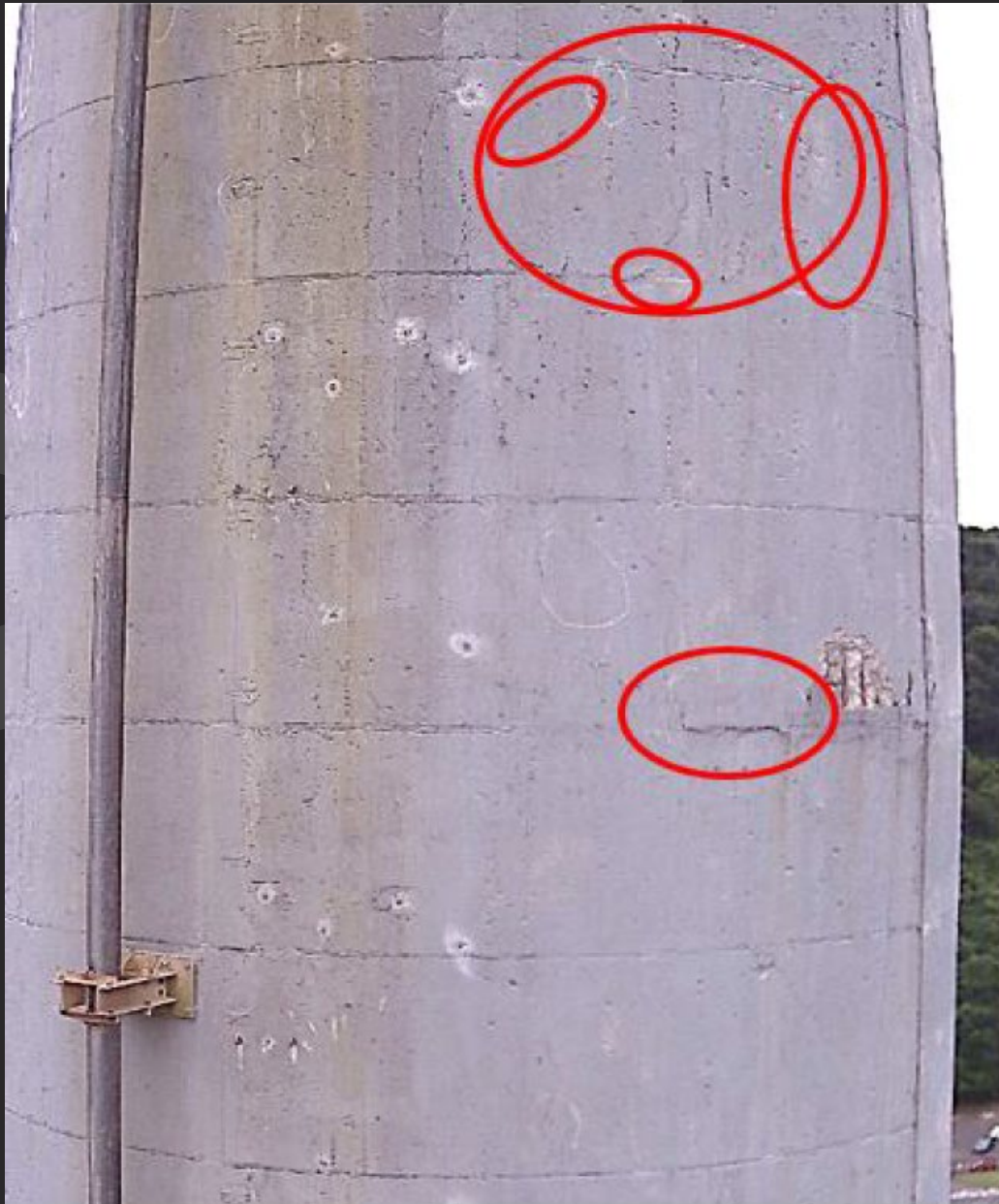


Figure 27: Top and Below, hotter white areas indicate material voids and loose material. White spot following straight lines typically indicate a joint that is not effectively repaired

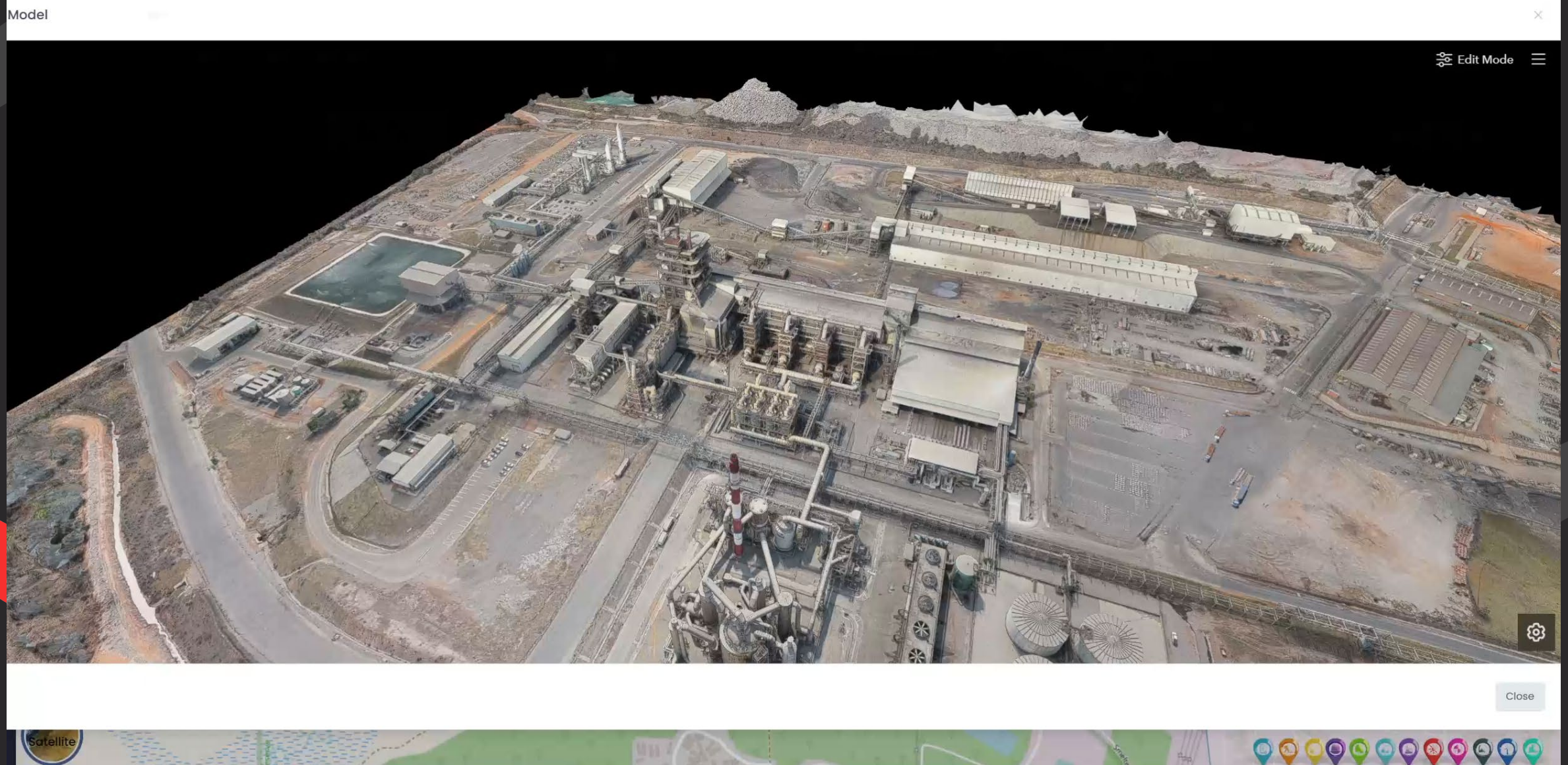


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GOING DEEP – MATERIAL ANALYTICS



LARGE SCALE AUDITS



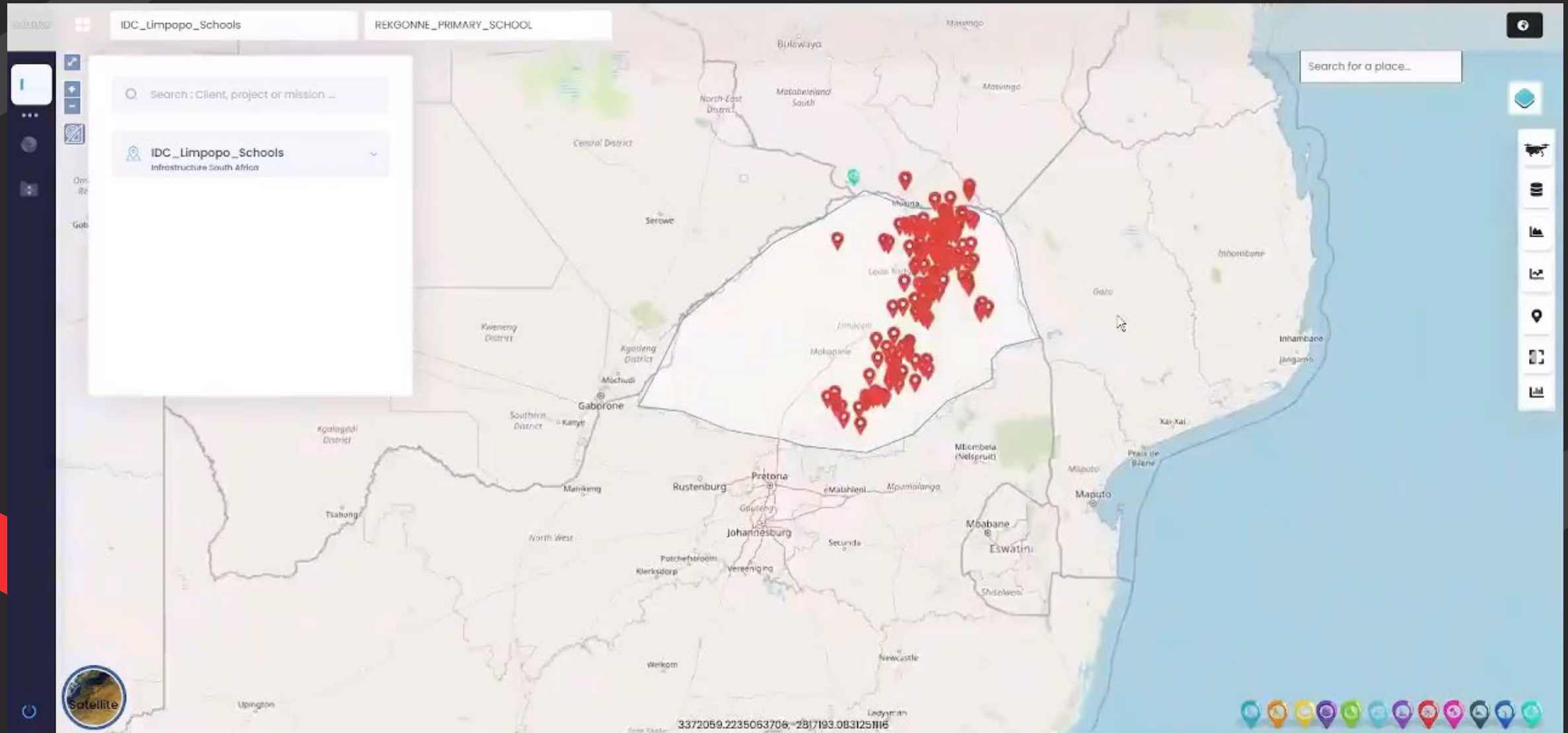
THE NEW ERA OF IMMERSION

WHAT IF YOU COULD BE THERE?
BUT NEVER LEAVE YOUR OFFICE

THE NEW ERA OF IMMERSION



PUBLIC SECTOR EDUCATION



CONFINED SPACE INSPECTIONS AND MAPPING



DISASTER RESPONSE

CITY PROPERTY ADMINISTRATION

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THE Sun



Q & A

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