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# New Technologies in Underground Projects: Drill Core Scanning, Documentation and Analysis

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# New Technologies in Underground Projects: Drill Core Scanning, Dokumentation and Analysis

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Singapore



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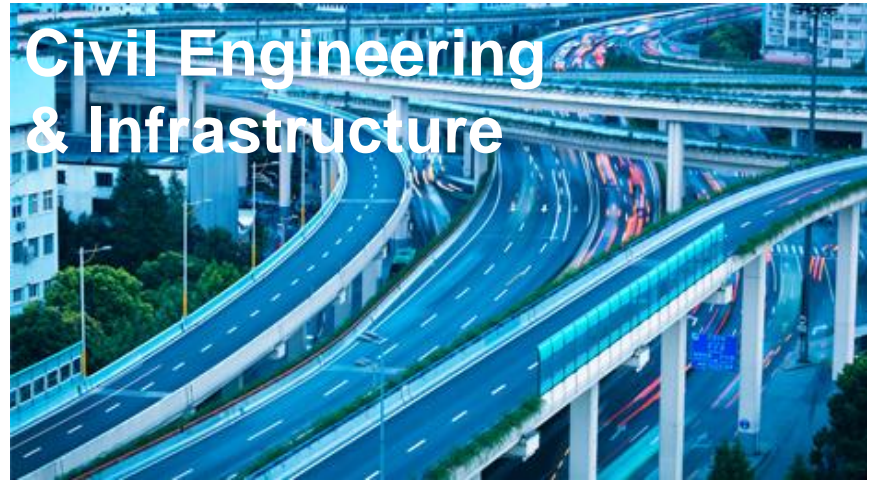


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# DMT CoreScan System

## Drill Core Scanning, Analysis and Database



DMT CoreScan3 - optical drill-core acquisition and storage unit (stand-alone)

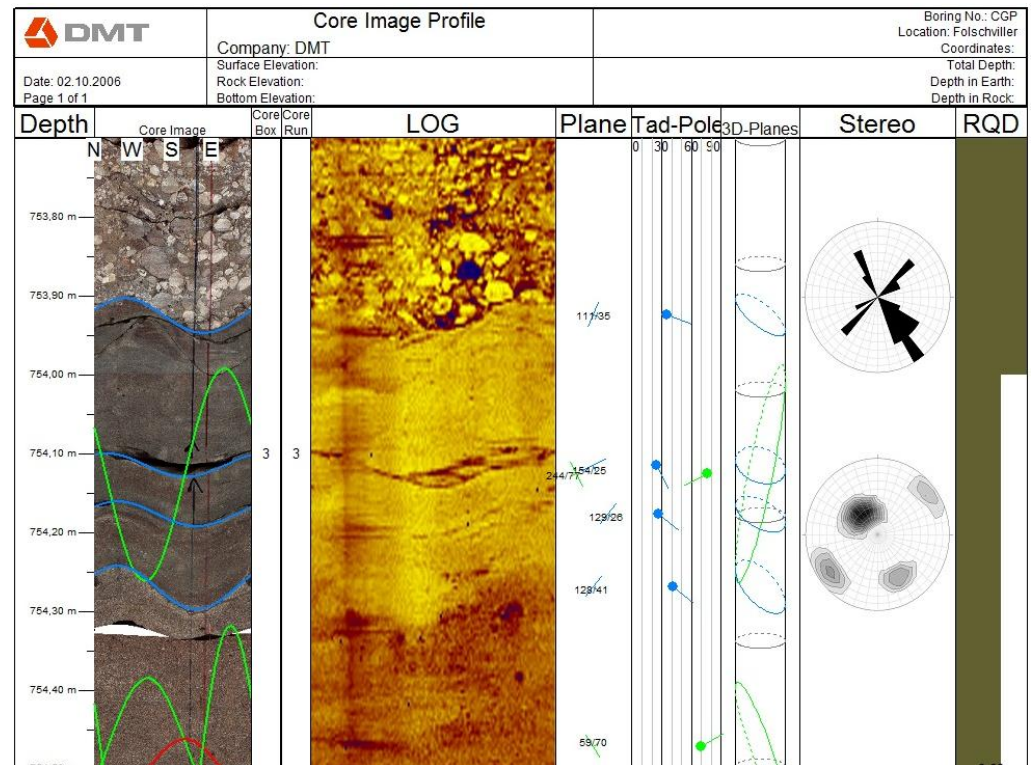


# DMT CoreScan System

## High tech Core Logging Tool



DMT CoreScan3 - optical drill-core acquisition and storage unit (stand-alone)



DMT CoreBase2 - digital drill core image logging software

# DMT CoreScan System

## High tech Core Logging Tool



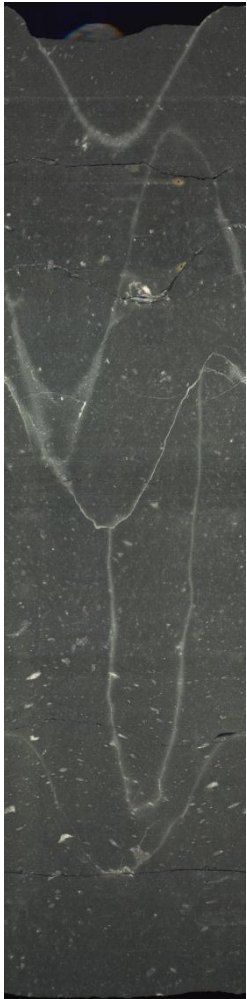
### DMT CoreScan3

- Drill Core Scanner
- High resolution images in the visible spectrum
- Line Scan Camera (push broom)

DMT CoreScan3 - optical drill-core acquisition and storage unit (stand-alone)

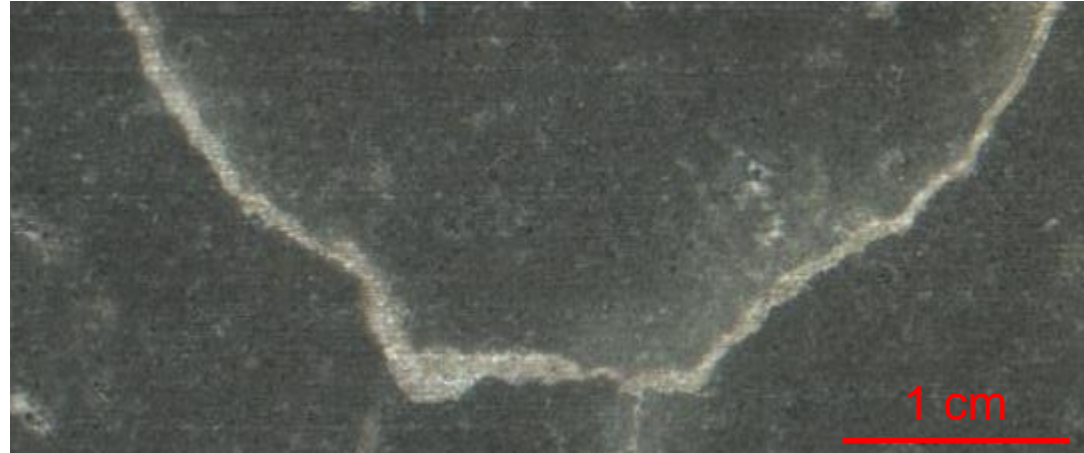
# DMT CoreScan3

## High tech Core Logging Tool



360° mode

10 pix/mm  
Standard resolution



40 pix/mm  
High resolution



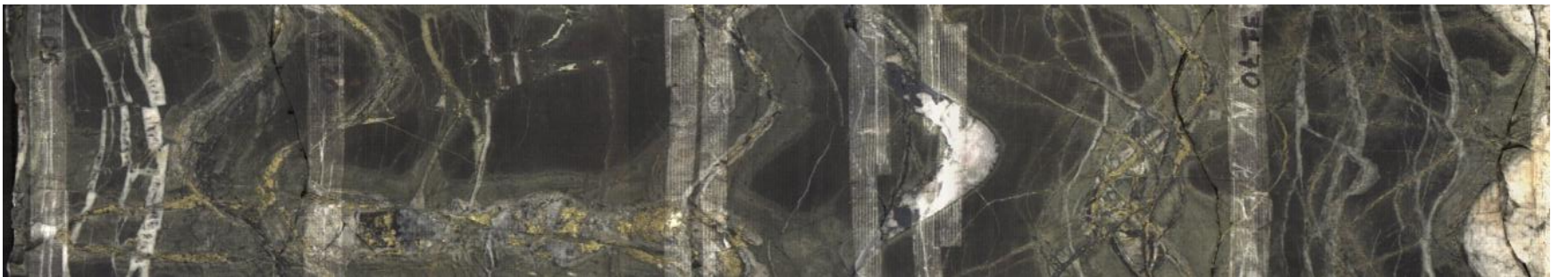


# DMT CoreScan System

## High tech Core Logging Tool

### Scan modes

- 360° mode: full circumference





# DMT CoreScan System

## High tech Core Logging Tool



### Scan modes

- plane mode: plane scan of single core or core boxes



# DMT CoreScan System

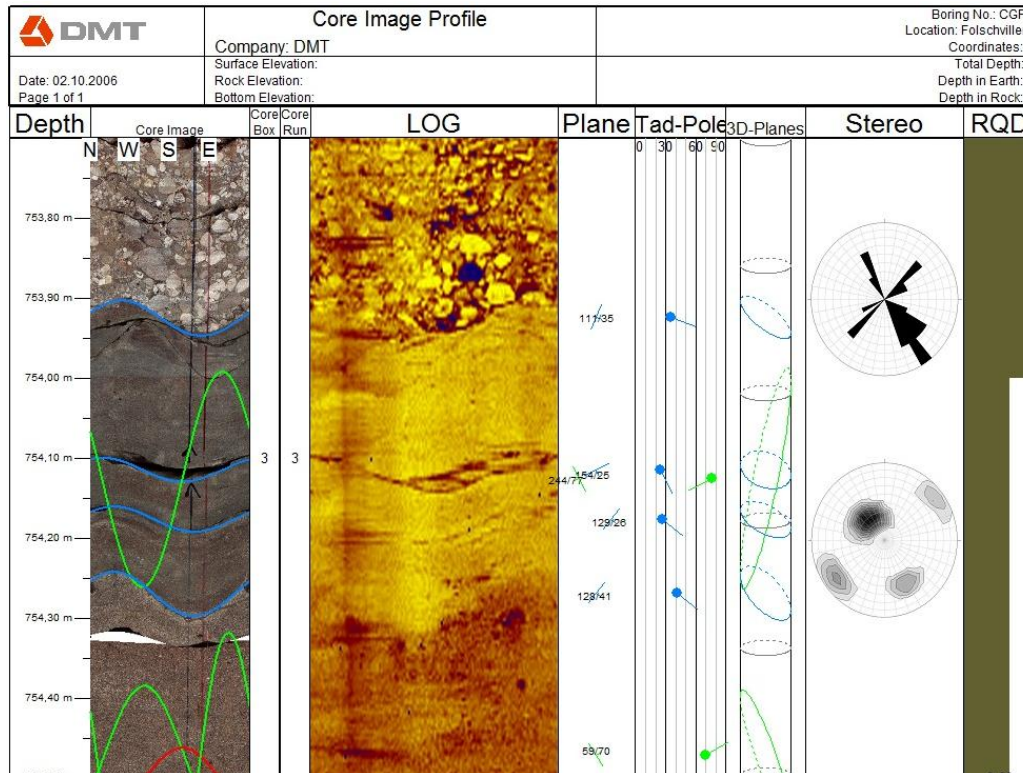
## High tech Core Logging Tool

### Scanning speed

- 360° mode: 20 seconds per meter  
(up to 180 m per shift)
- Plane mode: 30 seconds per box  
(up to 1000 m per shift)

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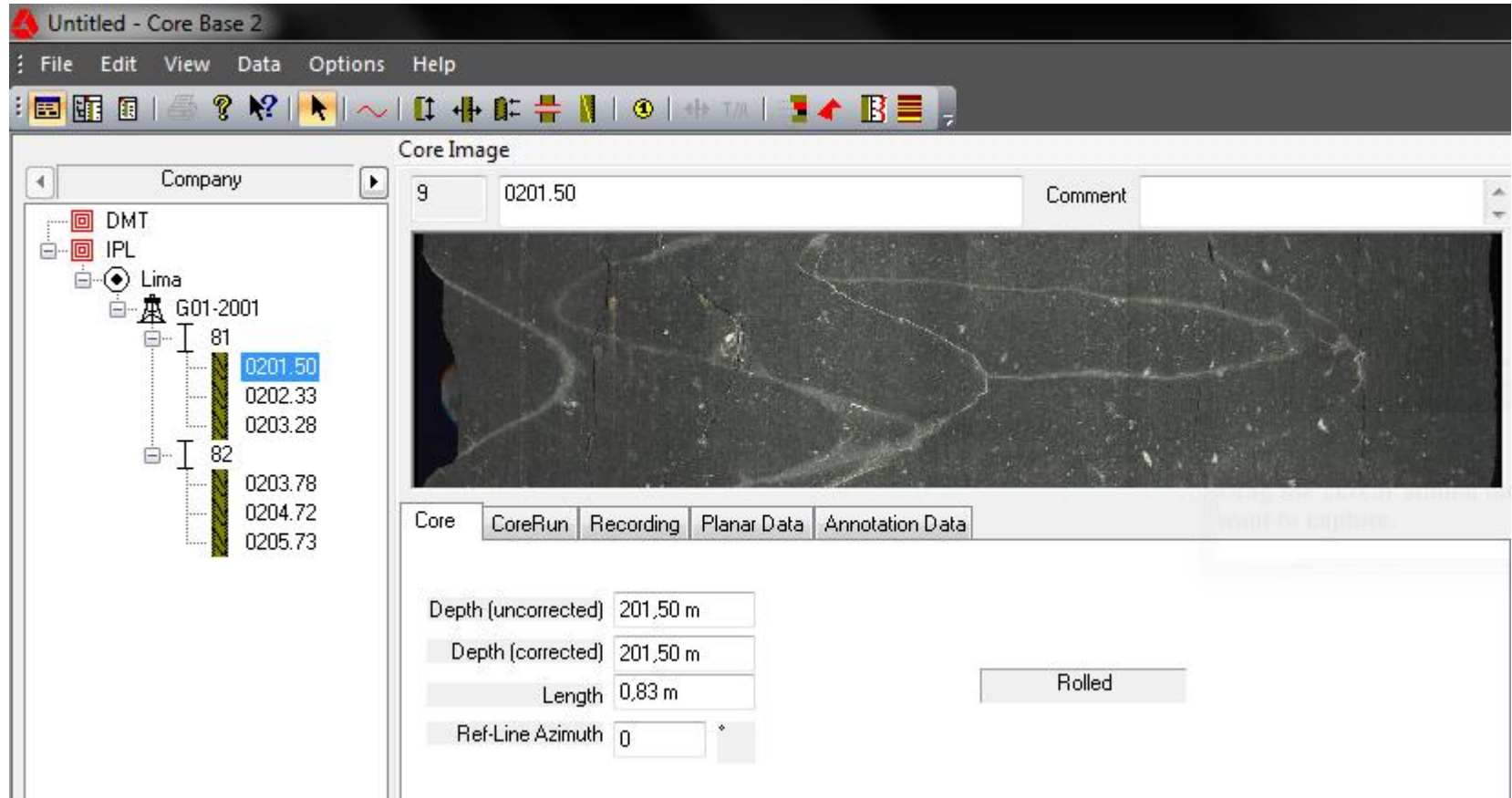


### DMT CoreBase2

- Digital drill core library
- Logging software
- Data integration
- Data base
- Online accessibility

# DMT CoreScan System

## High tech Core Logging Tool

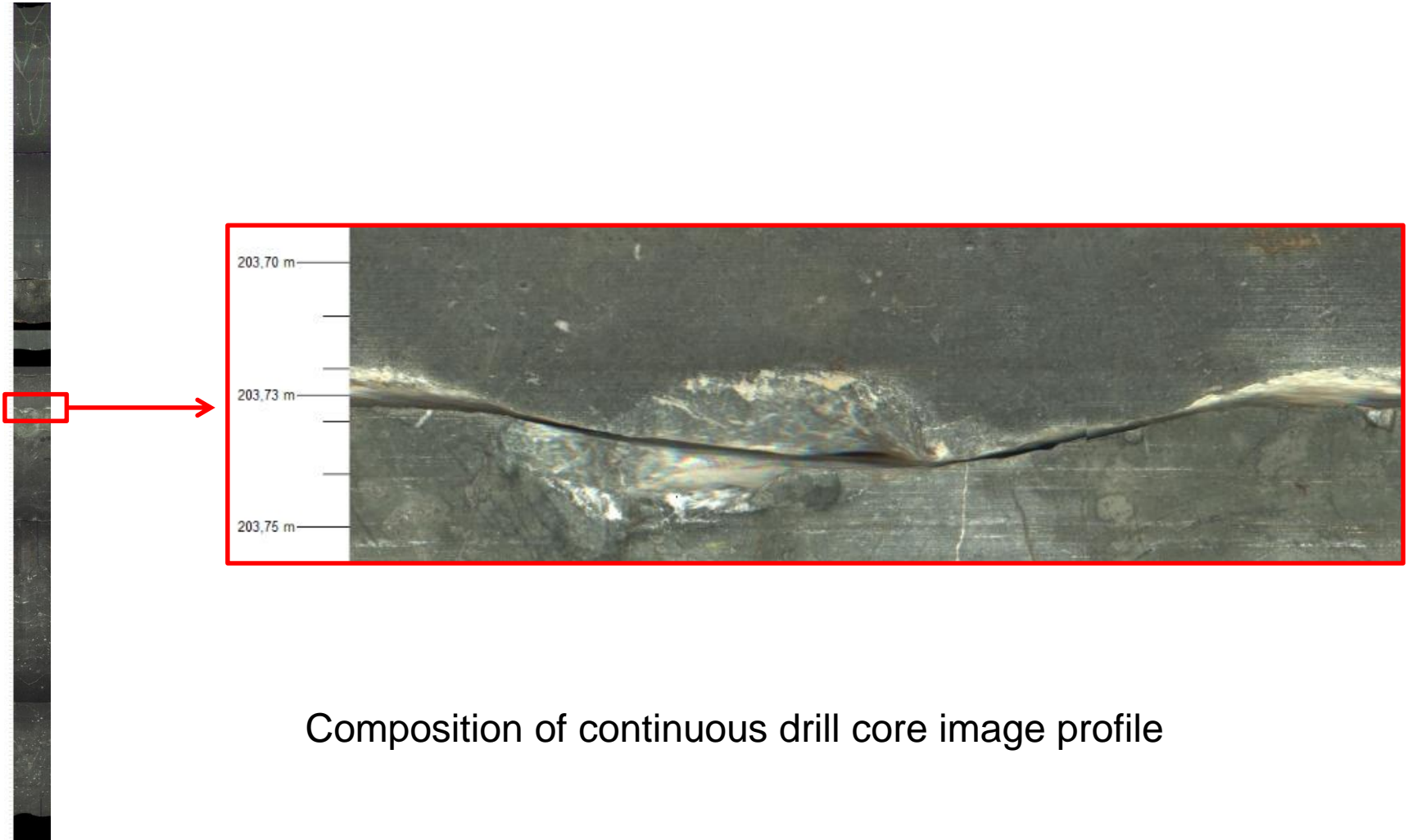


Digital drill core library– online accessibility



# DMT CoreScan System

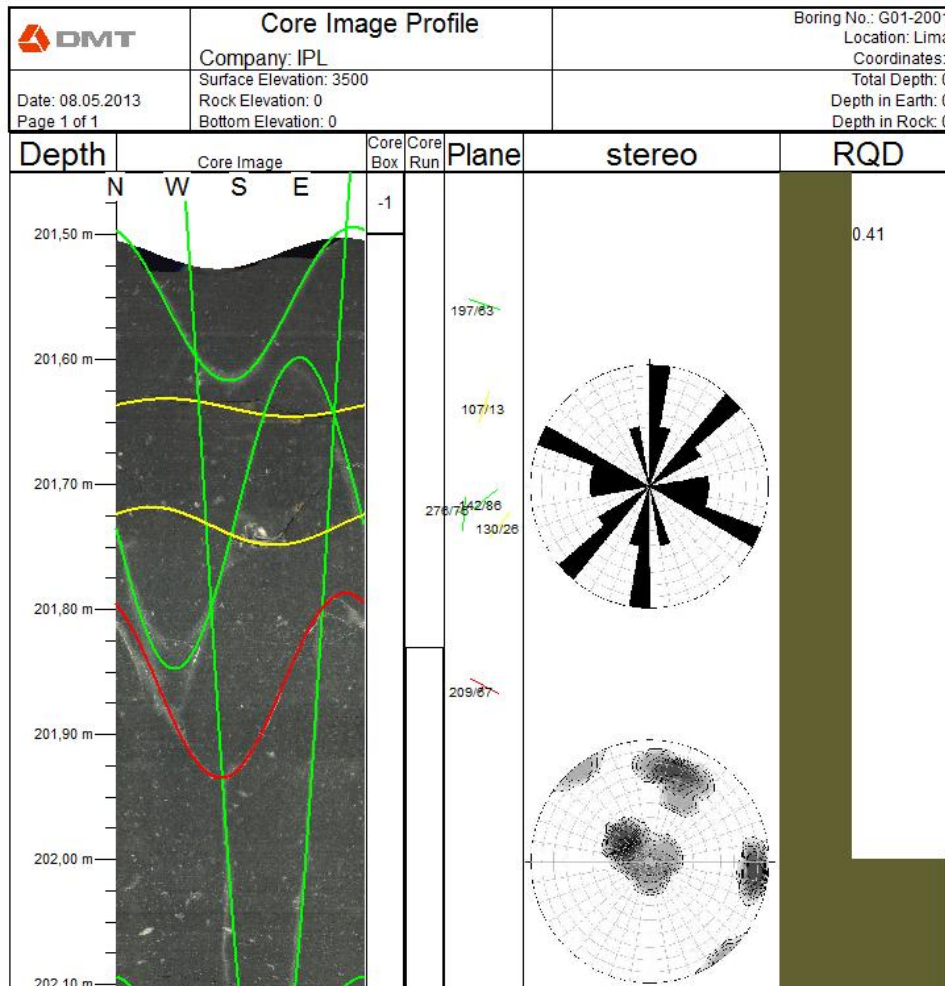
## High tech Core Logging Tool



Composition of continuous drill core image profile

# DMT CoreScan System

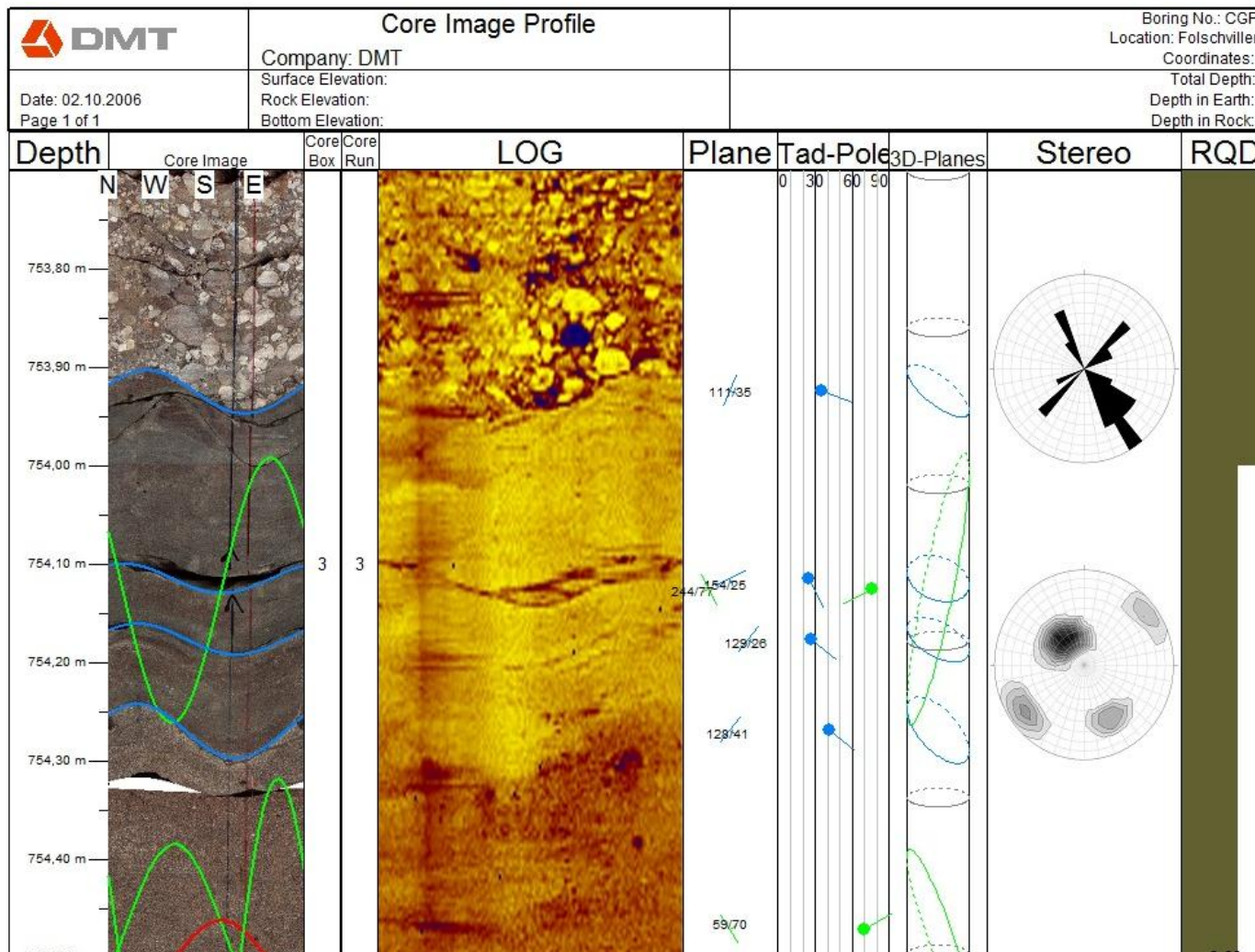
## High tech Core Logging Tool



- Drill core image orientation
- Structural analysis
- Geotechnical parameters (RQD, FD, FS)

# DMT CoreScan System

## High tech Core Logging Tool



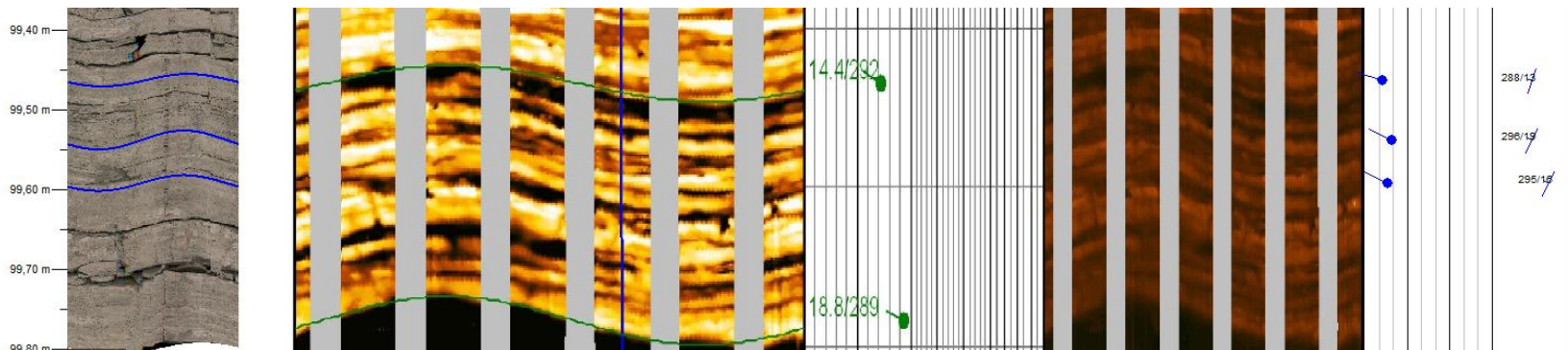
Data integration – example borehole geophysics

# DMT CoreScan System

## High tech Core Logging Tool

### Examples - Drill core image orientation

- The single drill core images have been orientated and depth adjusted by comparison with the FMI image and aligned to a continuous depth profile (please note that the core image appears mirrored to the borehole image).



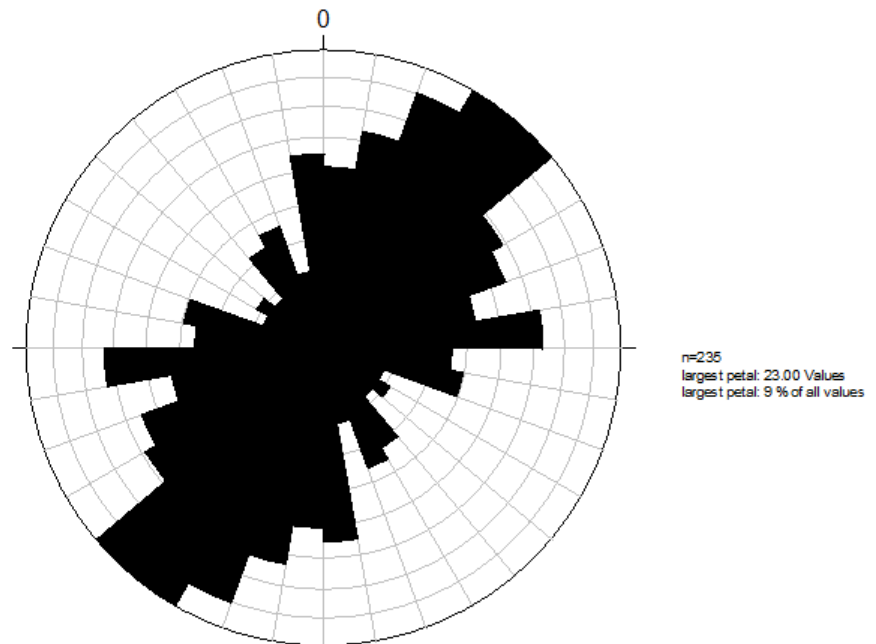
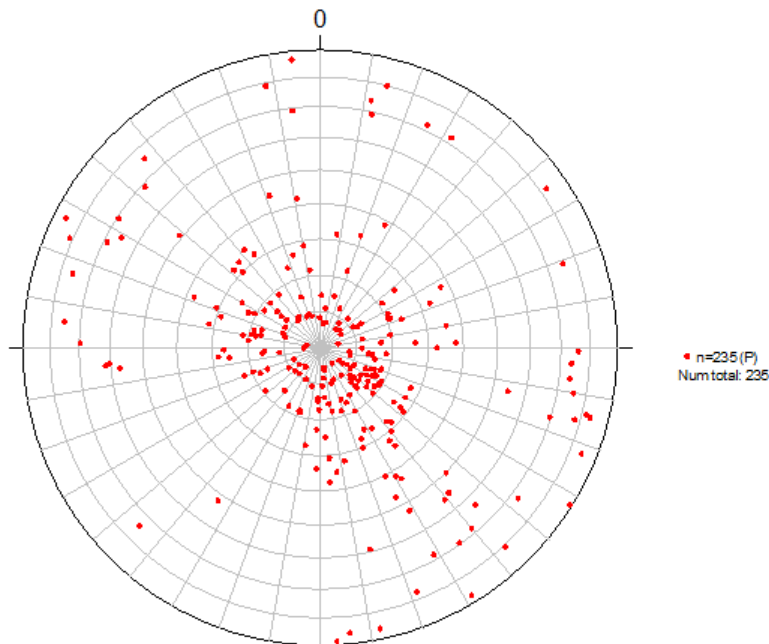


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## High tech Core Logging Tool

### Examples – Structure Analyzing

- Pole and rose (striking) diagram of the mineralized fractures, equal area projection lower hemisphere



# DMT CoreScan System

## High tech Core Logging Tool

### **Selected References from major infrastructure projects**

- Crossrail, the £15 billion cross-London rail link, UK
- Thames Tideway, the £4.2 billion (super sewer) Tunnel, UK
- HS2, the £50 billion London to Birmingham high speed rail link, UK
- New York City Subway, USA

# DMT CoreScan System

## High tech Core Logging Tool

### **A user's endorsement**

“The perceived advantage to Crossrail is primarily the ability to review the strata in very high detail and in a relatively fresh and undisturbed condition at any time during the subsequent design and construction phases regardless of the time that has passed. Core that is stored long term, even that stored in optimum conditions, will show some sign of deterioration and in the worst cases may be completely useless to designers and contractors”

Mike Black, Geotechnical Manager, Cross London Rail Links Ltd (Crossrail)

# DMT CoreScan System

## High tech Core Logging Tool

### **A user's endorsement**

“Since first introducing digital core scanning using the DMT Corescan to the UK geotechnical market we have found that many Clients, including those for major infrastructure projects such as Crossrail, Thames Tideway Tunnel and the High Speed Two (HS2) rail link, have specified the technique for use during ground investigations in recognition of the technical and commercial benefits that it brings.”

Digby Harman, Innovation Manager, Soil Engineering Geoservices Ltd (Part of the Soletanche Bachy Group), UK