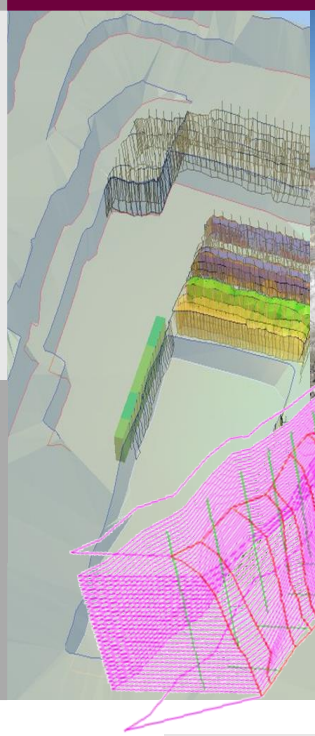
Case Study

QUARRY

IMPROVED PRODUCTIVITY WITHIN ENVIRONMENTAL CONSTRAINTS THANKS TO EPC EXPERTISE… FOR MORE THAN 10 YEARS

CLIENT	CB GROUP
SITE	CBS
PLACE	LIMONT-FONTAINE, FRANCE
PERIOD	2003-PRESENT



OBJECTIVES & CONSTRAINTE

- The CB Group CBS quarry extracts hard limestone in the north of France, close to Mauberge.
- Its production is around 800,000 tonnes per year, 50% of which is for civil engineering and concrete production, 25% for prefabricated factories and 25% for industry.
- Rough blast rock is loaded using a Hitachi ZX 650 shovel into 55 tonne Komatsu dumper trucks.
- CBS carries out its operations in a sensitive environment close to the villages of Limont-Fontaine and St. Rémy du Nord (90 m from housing).
- The quarry is located in a folded series of the Viséan (lower Carboniferous), the variable structure of which influences the results of blasting depending on the orientation of the fronts. The lithology is divided between limestone and dolomitic limestone areas, each of which presents significant mechanical heterogeneity (hardness, strength), requiring mining to be adapted accordingly.

KEY FIGURES

- Annual production: 650,000 to 800,000 tonnes
- Under contract since 2003

PHASE 1 RESULTS (2003 to 2007)

PRODUCTIVITY

- **+11%** on **site productivity**

VIBRATIONS

- **-50%** on **mean vibration level** (and up to –70%)

FRAGMENTATION

- **+30%** in **crusher productivity**
- **-23%** on **mean fragment size**
- **-70%** on **block rework time**

LOADING / TRANSPORT

- **+20%** on **heap spreading distance**
- **-60%** on **height of cleaved heap**
- **-20%** on **loading time**
- **-10%** on **loading / transport cycle**

2007–PRESENT: Maintain / improve results despite an increasingly complex environment (distance to nearby residents, geology, etc.)

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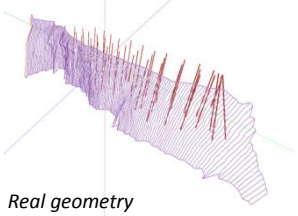
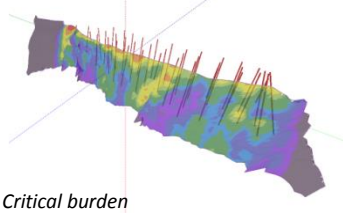
SAFETY, TECHNOLOGY AND CONTROL

A custom ad hoc protocol for top-level engineering services supported by an appropriate product mix (electronic detonators, high energy cartridge emulsions and on-site manufacturing):

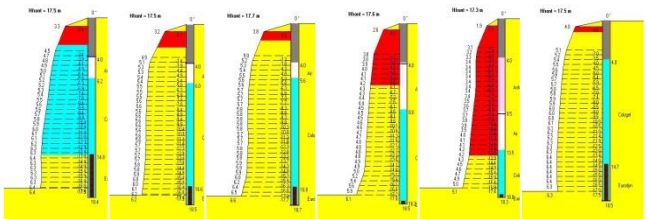
1. Topographical lift of working face to be mined using automated 3D laser station
2. Computer definition of boring site taking account of the geometric model of the block to be cleaved
3. Actual location of bore hole positions and control of actual coordinates
4. Measurement of bore hole deviations of holes using inclinometer sensor
5. Computer reconstruction of the geometric model, including actual geometry of bore holes
6. Hole-by-hole design of the loading plan taking account of the individual geometry and meeting a **specific given energy target**
7. Blasting carried out with update of quantities actually loaded
8. Blasting always video-recorded
9. Record of the blasting plan created in the overall topographical model of the quarry



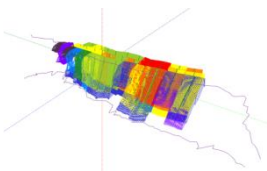
Real geometry



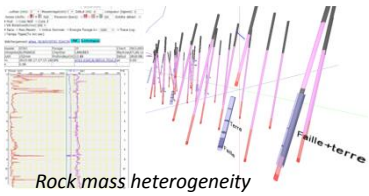
Critical burden



Hole-by-hole loading pattern



Energy distribution



Rock mass heterogeneity

ESPRIT D'ÉQUIPE

Safety — EACH BLAST TRIGGERED USING A WIRELESS CONSOLE

Passion

Integrity — CONSTANT PARTNERSHIP TO ENSURE CONTROL OF BLASTING

Respect

Innovation — CONTROLLED DRILLING, ELECTRONIC INITIATION, HIGH-ENERGY EMULSION & ON-SITE MANUFACTURING

Technology

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