

Comprehensive Geological Evaluation of Dam Rock Foundation

ダム基礎岩盤の地質的総合評価

▶ Background of Dam Rock Foundation Evaluation

Due to the vast surface of dam rock foundation, excavation is carried out over a long period of time, and evaluation is also conducted over a similarly long period.

However, there have been several global examples until now in which dam destruction occurred not only in the dam surroundings, but the entire downstream area suffered serious damage. As a result, there is a need to fully confirm safety, and high precision is also required in the evaluation of rock foundation.

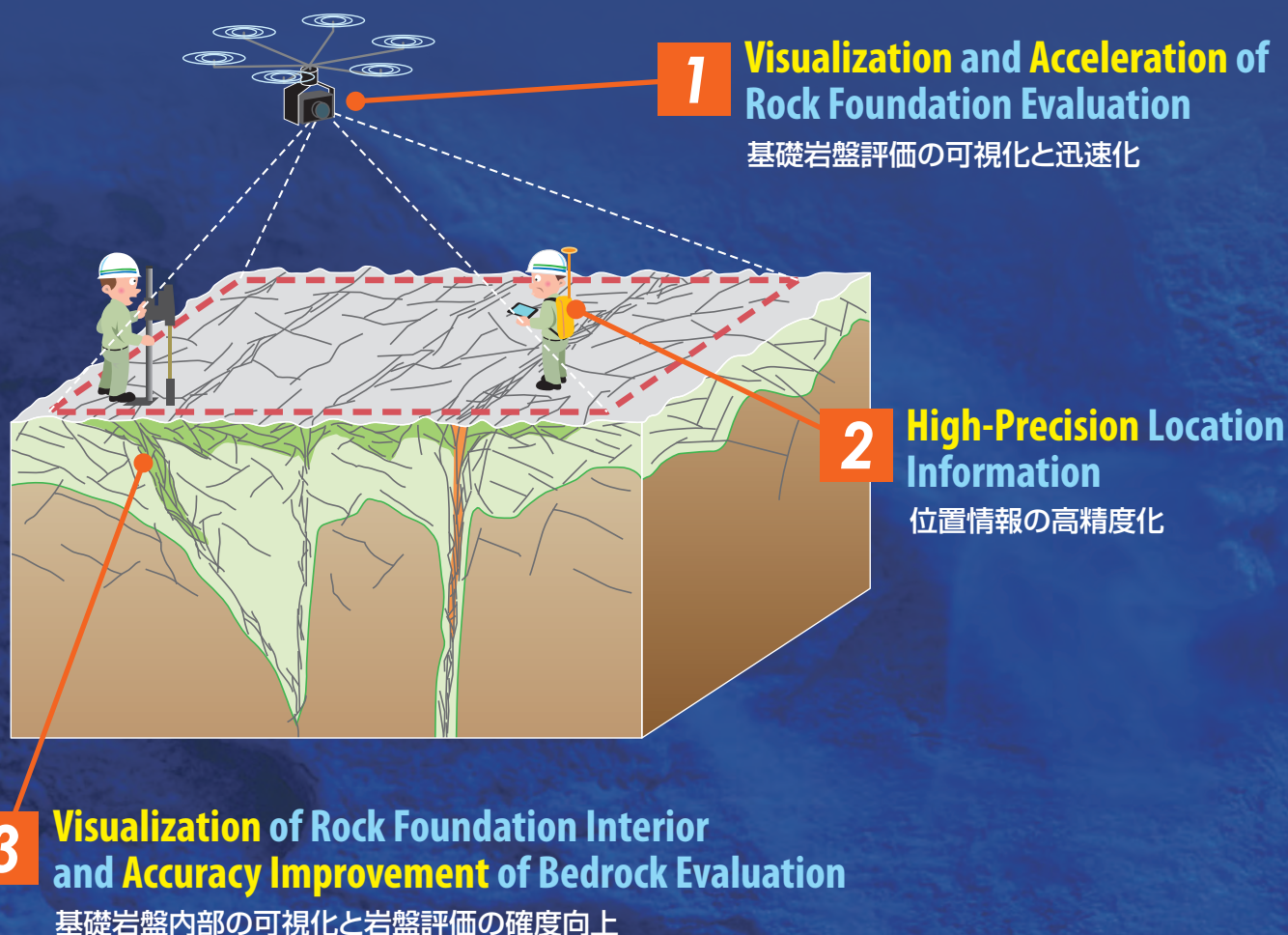
●ダム基礎岩盤評価の背景

ダム基礎岩盤は広大な面積となるため、掘削・評価は長期間にわたって実施することになります。ダムの破壊は、周辺ばかりでなく、下流域一帯が甚大な被害が及ぶため、確実に安全であることが求められ、基礎岩盤の評価も高い精度が求められます。

▶ 3D Bedrock Evaluation Schematic Diagram (Example)

*Usually, evaluation of rock foundation is determined with a combination of three elements: “rock hardness”, “crack characteristics”, and “crack intervals”.

●三次元的な岩盤評価の概要図(例) ※基礎岩盤の評価は通常、「岩石の硬さ」「割れ目の状態」「割れ目の間隔」の3要素の組合せで決定します。



1 Visualization and Acceleration of Rock Foundation Evaluation



Acceleration of the evaluation task and objective evaluation via simplified remote sensing (aerial images taken by multicopter)

●基礎岩盤評価の可視化と迅速化

簡易リモートセンシング(マルチコプターによる俯瞰画像)により評価作業の迅速化と客観的評価

[Equipment Overview]

Multicopter body: SK900HV revision

Proportional controller: FUTABA Digital Proportional R/C system 14SG

Digital Camera: Panasonic DMC-GH2

Flight endurance time: 15 minutes

Maximum altitude: Around 300 meters

Flight endurance distance: Around 1 kilometer from operation location

2 High-Precision Location Information

Record location information with high precision via a field survey using a tablet with GIS engine

●位置情報の高精度化

GISソフトを搭載した情報端末とGPSセンサを携帯することにより、位置情報を高精度に記録

[Equipment Overview]

・Tablet: ASUS Nexus 7

・GPS device: Trimble GPS Pathfinder PRO series ProXT

Location information display
(example)



Site measurement conditions

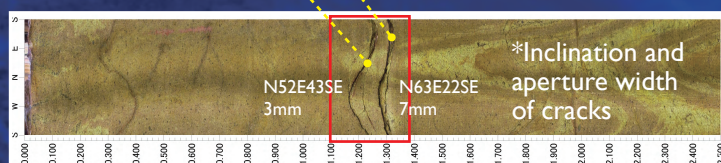
3 Visualization of Rock Foundation Interior and Accuracy Improvement of Bedrock Evaluation

Boring core using simplified machine and wall image taken with a borehole camera, the status of loosening in the interior of the rock foundation and crack characteristics can be ascertained

●基礎岩盤内部の可視化と岩盤評価の精度向上

簡易ボーリングコアとボアホールカメラによる孔壁画像で、岩盤内部のゆるみ状態や割れ目性状を把握

Boring core



Wall image taken with a borehole camera



Drilling conditions using a simplified boring machine



Docon Co., Ltd.

1-5-4-1, Atsubetsu-chuou, Atsubetsu-ku, Sapporo 004-8585, Japan

Telephone: +81-11-801-1500 (main number)

E-mail: info@docon.jp URL: www.docon.jp

総合建設コンサルタント

株式会社ドーコン

札幌市厚別区厚別中央1条5丁目4-1

TEL. 011-801-1500 (代) FAX. 011-801-1600