
Subsurface dam
Ie island, Okinawa
Japan
11-14 Apr 2011

8 Subsurface dam in Okinawa

- Finished 7 projects
- Constructing 1 project


Okinawa
National capital
City
International border
Province boundary
Primary road
0 15km
0 10Mi
127°45'
128°00'
128°15'
26°45'
26°30'
26°15'
East China Sea
Philippine Sea
Okinawa
Hienza
Oku
Kunigami
Ogimi
Higashi
Nakijin
Motobu
Ie
Nago
Onna
Ginoza
Kin
Ishikawa
Yomitan
Kadena
Gushikawa
Okinawa
Ginowan
Urasoe
Naha
Tomigusuku
Yonabaru
Sashiki
Chinen
Tamagusuku
Itoman
Goshikami
N
Japan
China
North Pacific Ocean
Okinawa
South China Sea
Philippines

Ie National Irrigation Project

- National Irrigation Project Office of Ie Okinawa General Bureau.
- Subsurface dam will be Ie island' s treasure in a future.
- Ie Island, water necessary for farming relies heavily on rain and small reservoirs, currently there is not enough water available causing agricultural production to be unstable. The lack of a steady water supply impedes agricultural growth and development.

Objective of the Project

- To built a subsurface dam, water pumps and irrigation canals that will be provide water to 668 ha of farmable land.
- Smaller capillary irrigation canals established by Okinawa prefecture and Ie village aim to ensure the availability of water supply, improve agricultural productivity and modernization efforts, and to stabilizer agricultural operations.

Agricultural Operational Plan

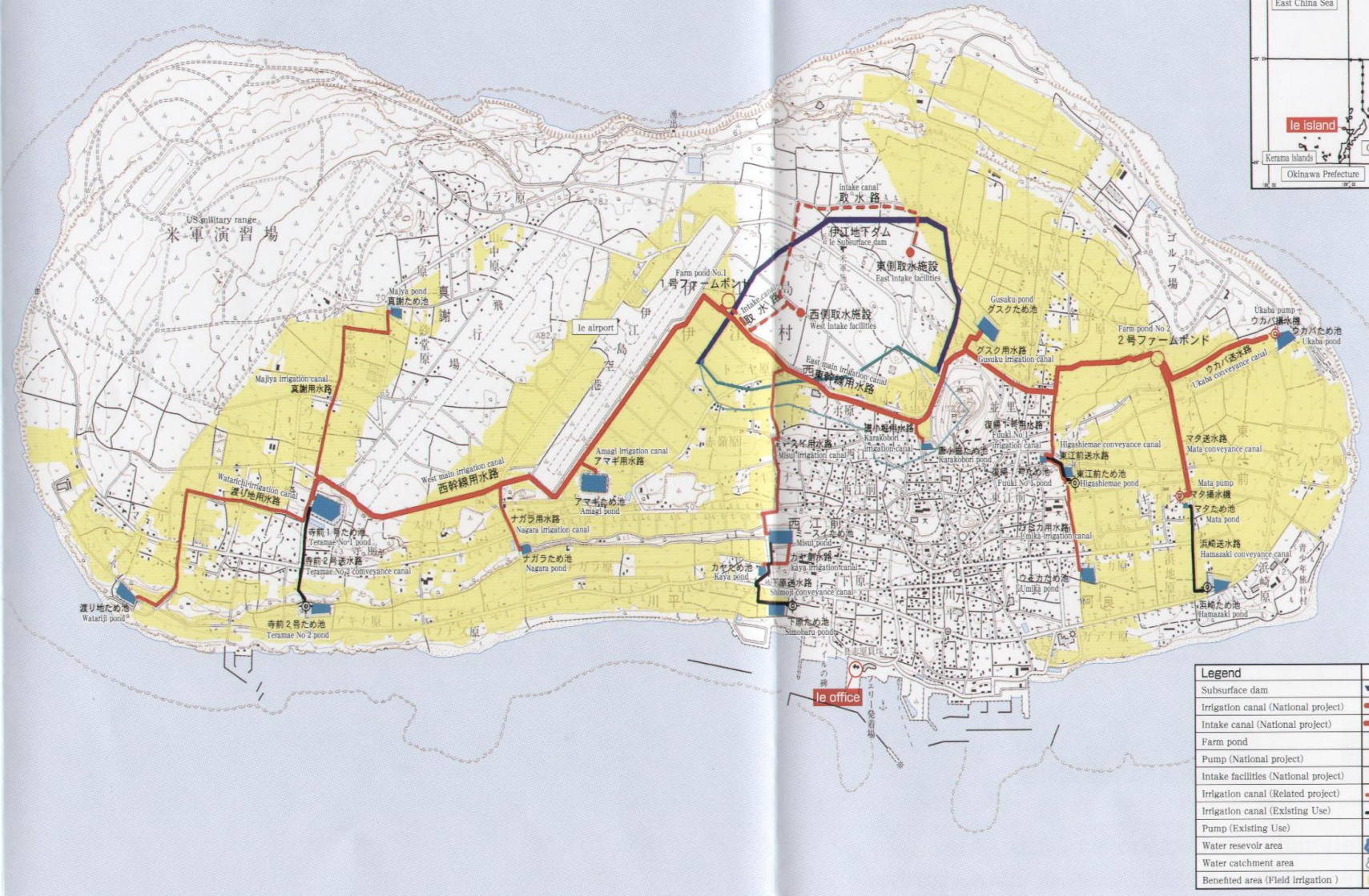
Agricultural Operation of Tobacco

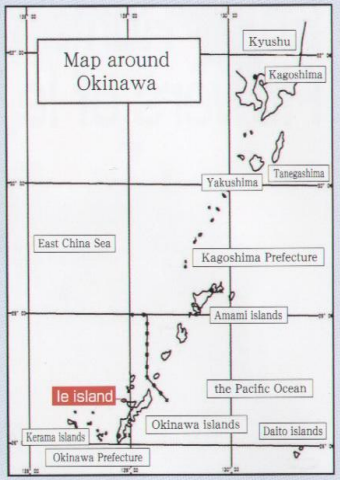
Agricultural Operation of Chrysanthemums

Cultivation of Mangos

Shipping operation of white melons

General Map of the Project S=1:25,000





Legend	凡　例
Subsurface dam	地下ダム
Irrigation canal (National project)	用水路（国営）
Intake canal (National project)	取水路（国営）
Farm pond	ファームポンド
Pump (National project)	揚水機（国営）
Intake facilities (National project)	取水施設（国営）
Irrigation canal (Related project)	用水路（関連事業）
Irrigation canal (Existing Use)	取水路（既設利用）
Pump (Existing Use)	揚水機（既設利用）
Water resevoir area	貯水区域
Water catchment area	集水区域
Benefited area (Field irrigation)	受益地

2. Summary of the National Project

(1) Objectives of the Project Improvement of irrigation
irrigation for farmland

(2) Benefited Area 668ha

(3) Contents of National Project

1. Subsurface dam

Name	Type of Dam body	Details		
		Height (m)	Length (m)	Capacity (m^3)
Ie Subsurface dam	Soil mixing wall type subsurface dam	55.90	2,612	754,000

2. Farm ponds

Name	Capacity (m^3)	Remarks
Farm pond No.1	6,700	
Farm pond No.2	1,500	

3. Pumps

Name	Details	Remarks
Mata Pump	2 under water pump, pumping capacity 0.011m^3/s	Pumping from Mata pond
Ukaba Pump	2 under water pump, pumping capacity 0.003m^3/s	Pumping from Ukaba pond

4. Water pipe lines

Name	Details	Remarks
East main irrgation canal	Water pipe line, 3.2km long	
West main irrgation canal	Water pipe line, 3.3km long	
Gusuku irrgation canal	Water pipe line, 0.2km long	
Mata conveyance canal	Water pipe line, 0.8km long	
Ukaba conveyance canal	Water pipe line, 0.8km long	

4. Construction Period of the National Project

Start: F.Y. 2005, Finish:F. Y. 2014

5. Project Cost

The cost of this National Project, including the construction of the Ie subsurface dam, irrigation canals, farm ponds (water tanks), pumping facilities with water lines, is 25 billion yen (expressed in 2002 values).

90 % Japan government

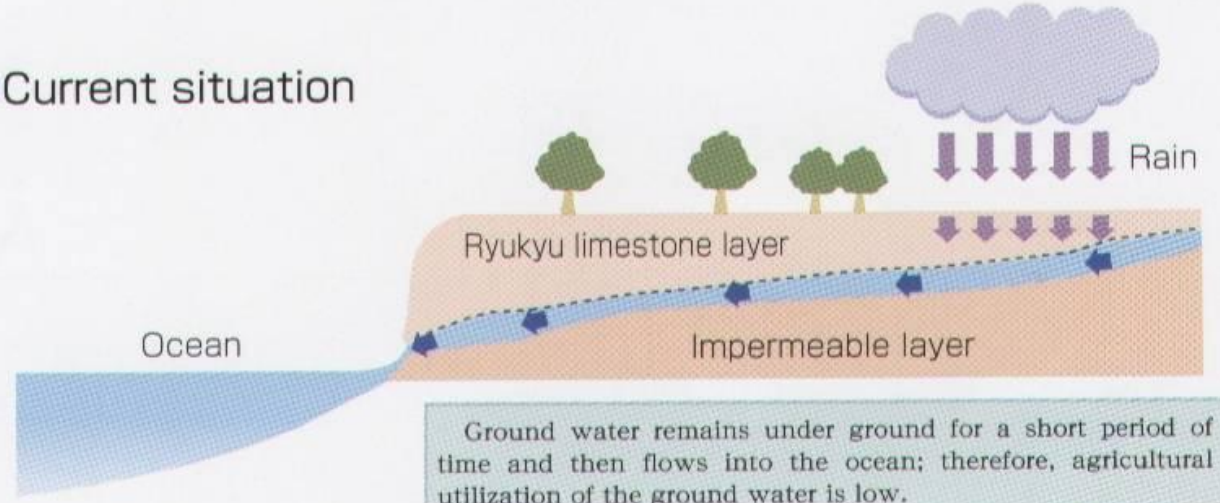
6 % Okinawa government

4 % Ie island (Operation and management)

Role of Subsurface Dam

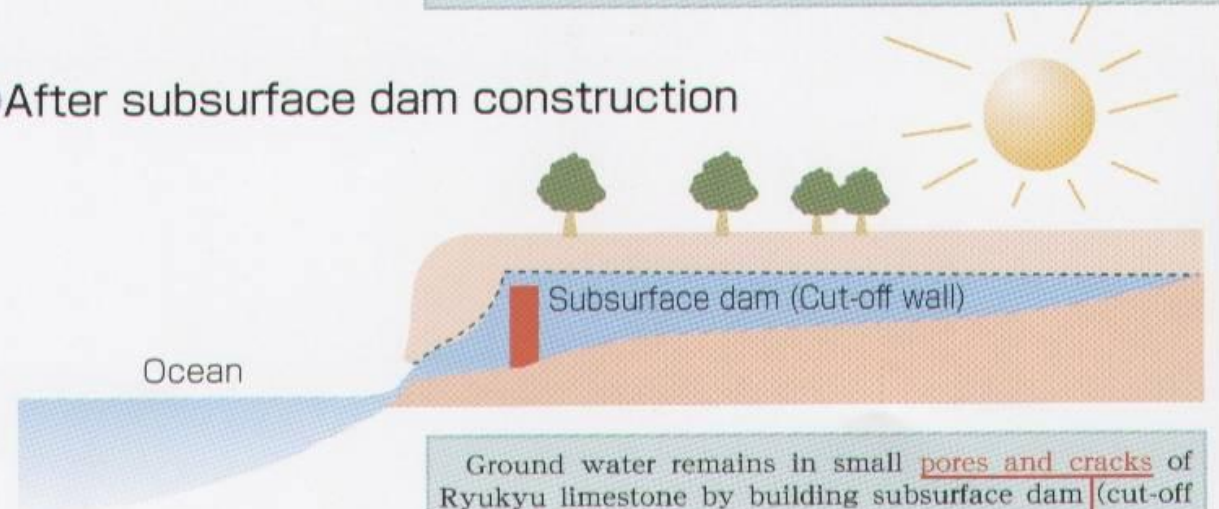
■Will be able to save water in Ryukyu limestone layer by building the subsurface dam.

●Current situation



Ground water remains under ground for a short period of time and then flows into the ocean; therefore, agricultural utilization of the ground water is low.

●After subsurface dam construction

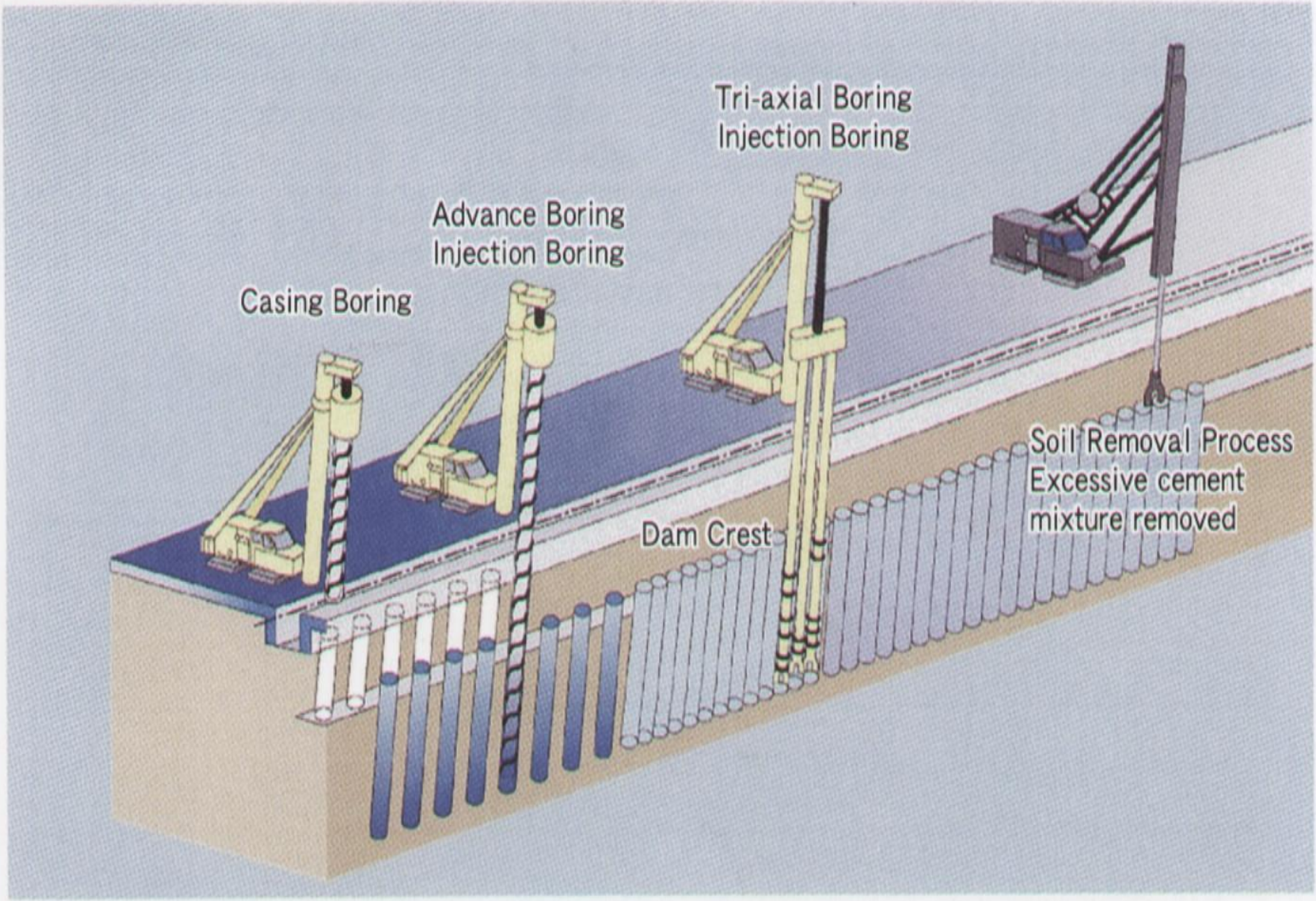


Ground water remains in small pores and cracks of Ryukyu limestone by building subsurface dam (cut-off wall).

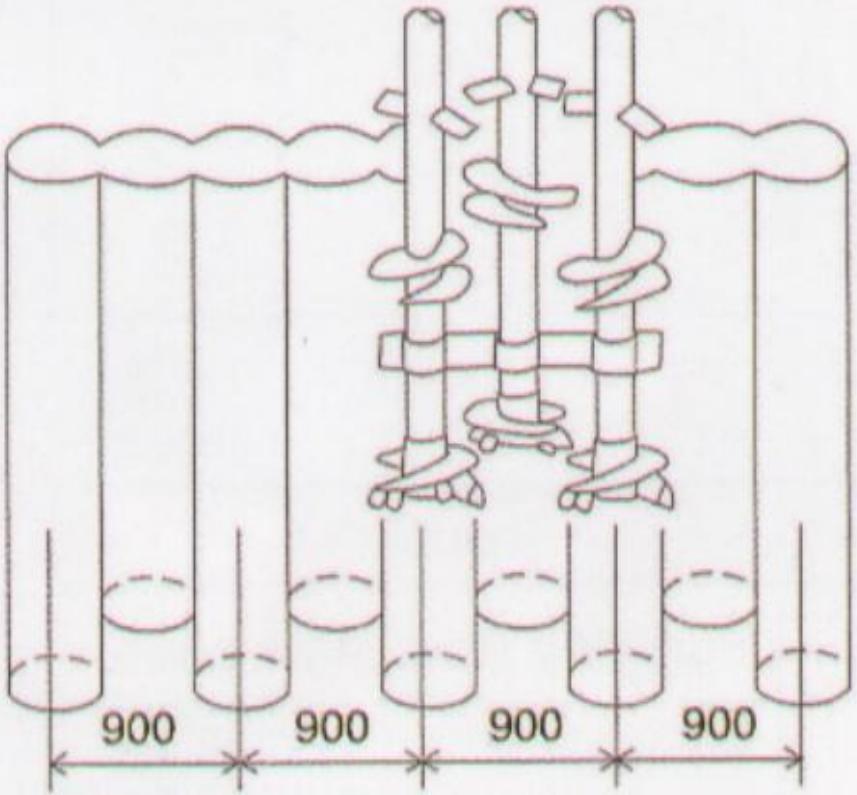
Ryukyu limestone

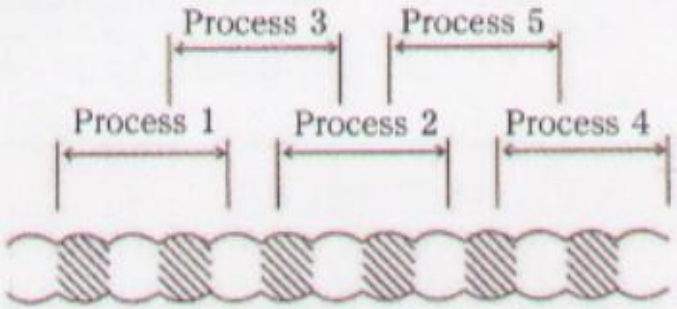
Water remains in pores and cracks of Ryukyu limestone

Flow Chart for Construction Process of Cut-off wall

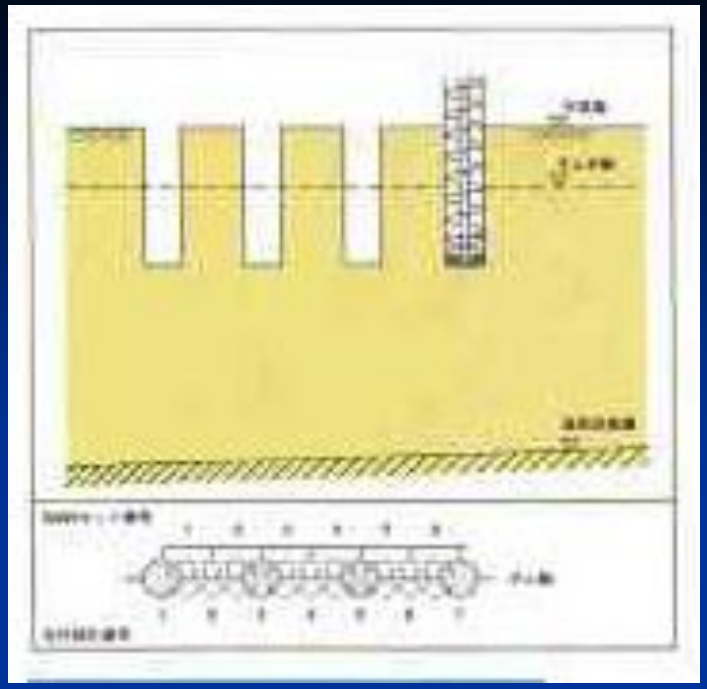


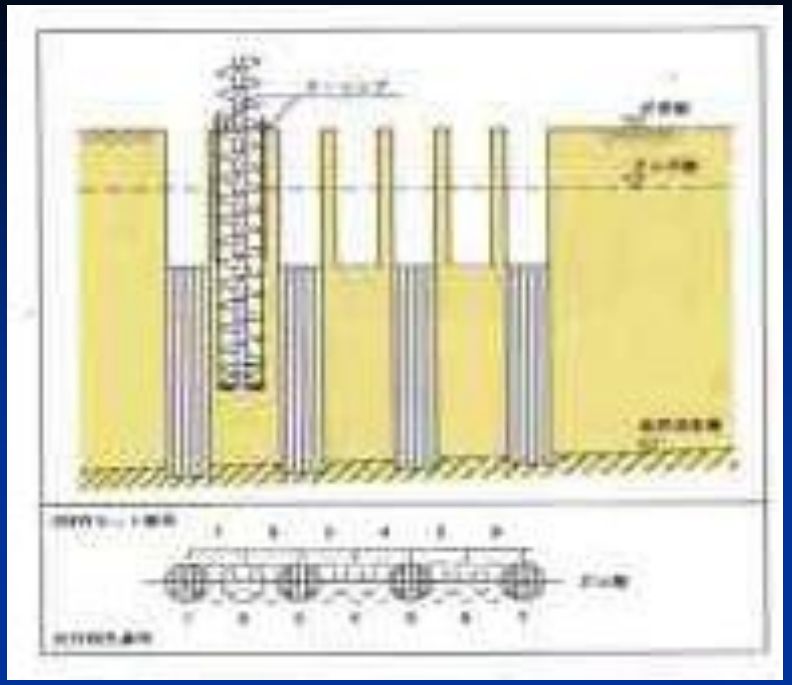
Construction of Cut-Off Wall

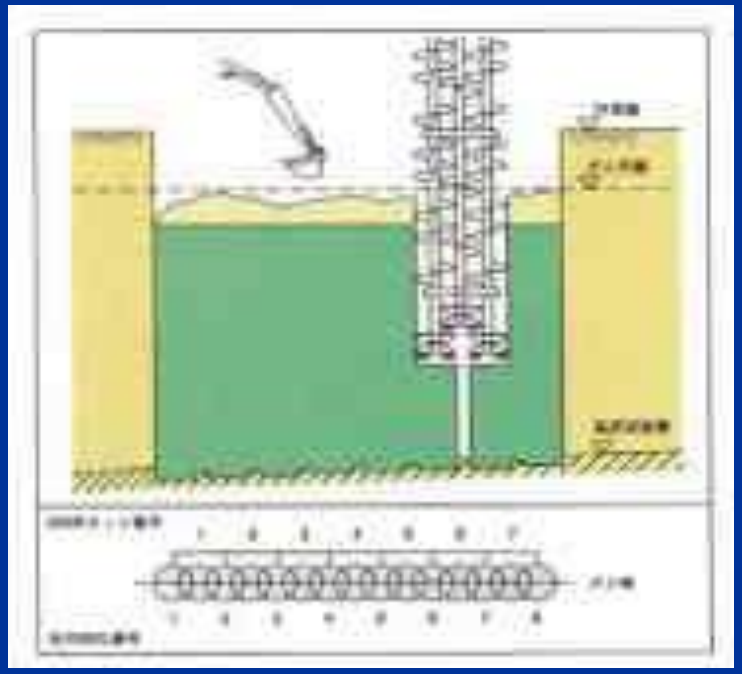




Shaded area shows total overlap section.

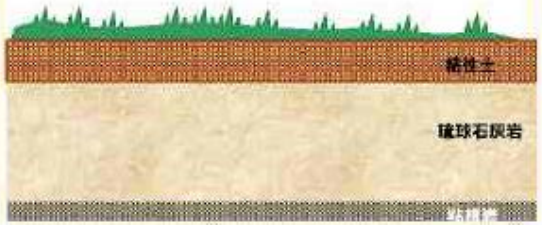






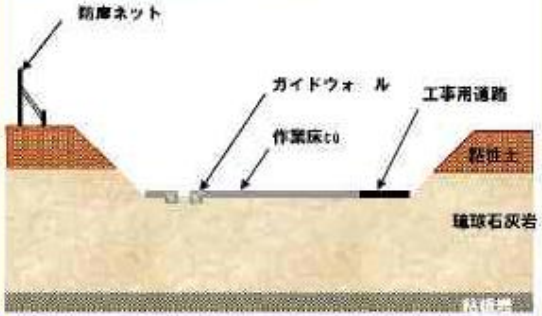
原位置攪拌工法（ＳＭＷ工法）による地下ダム止水壁造成の施工手順　　（北工区工事）

① 準備工（地質・用地・不発弾探査等調査）

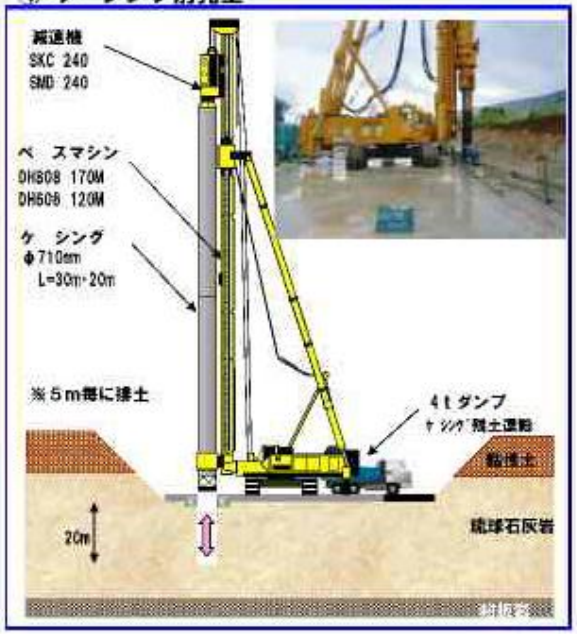


② ヤ　ド造成工

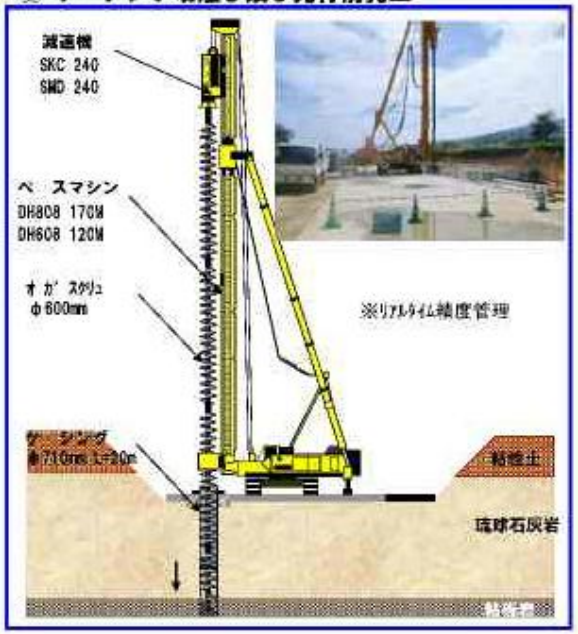
③ 作業ヤ　ド仮設備工（ガイドウォ　ル・作業床等）



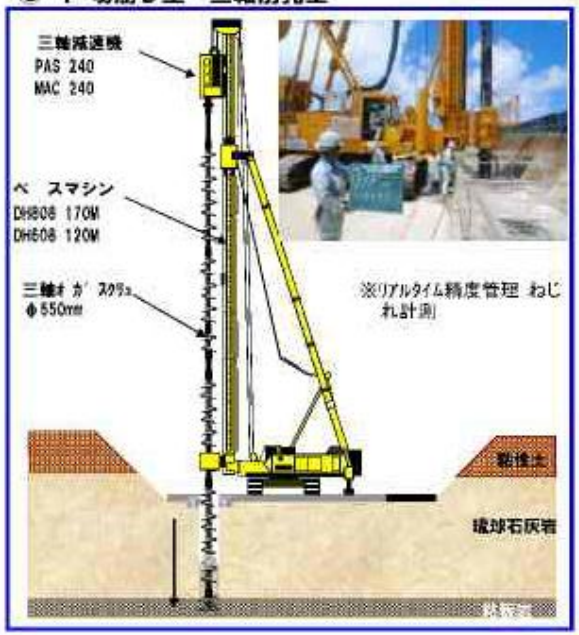
④ ケ　シング削孔工



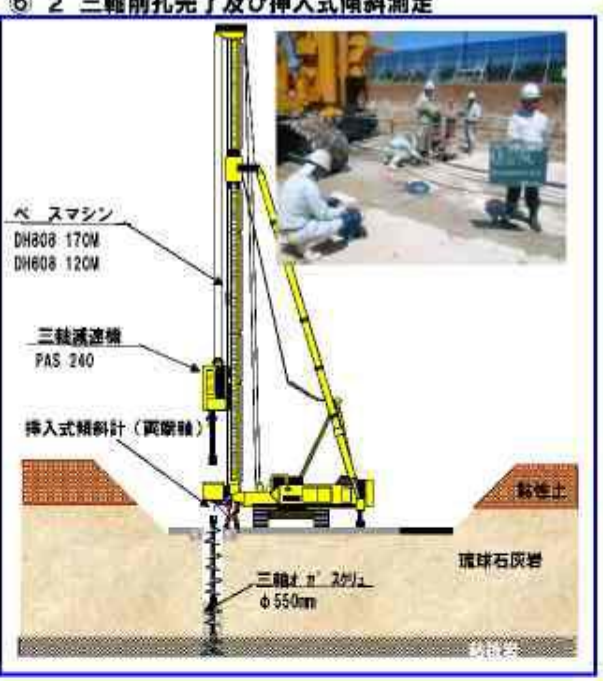
⑤ ケ　シング切離し及び先行削孔工



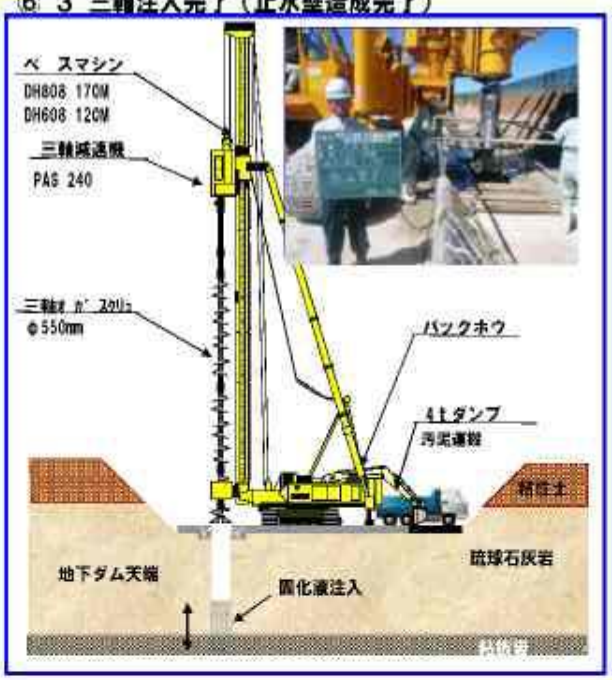
⑥ １ 切崩し工・三軸削孔工



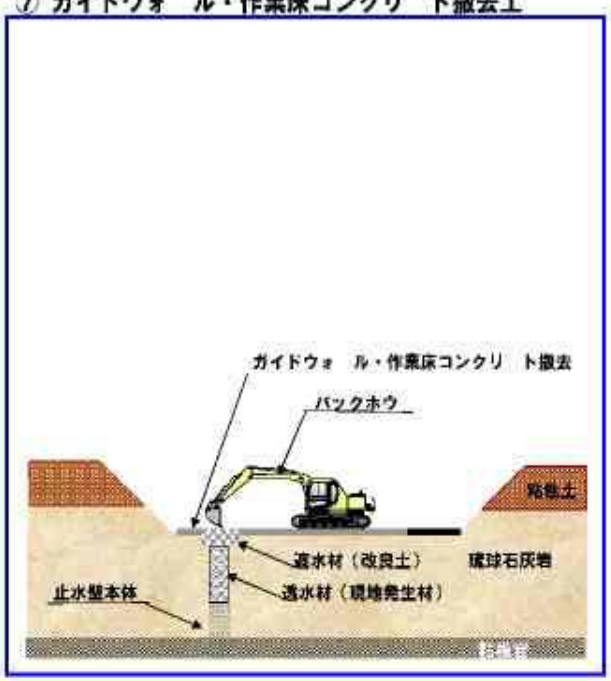
⑥ 2 三軸削孔完了及び挿入式傾斜測定



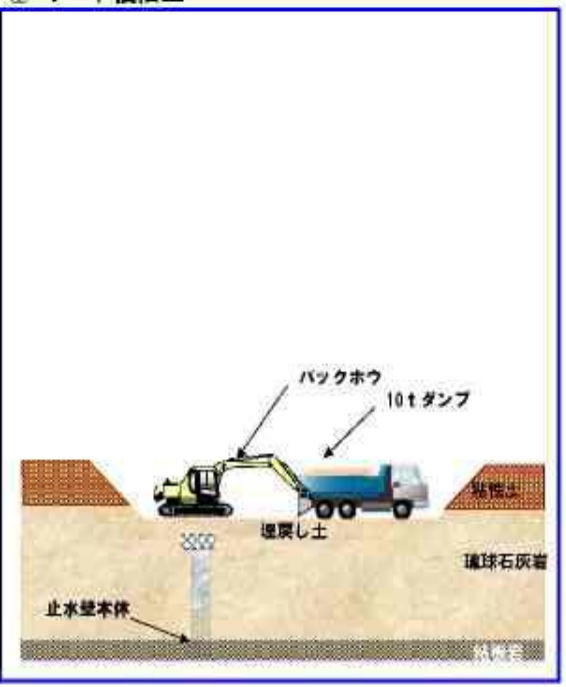
⑥ 3 三軸注入完了（止水壁造成完了）



⑦ ガイドウォ ル・作業床コンクリ ト撤去工



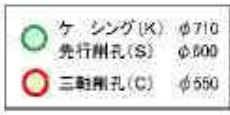
⑧ ヤ ド復旧工

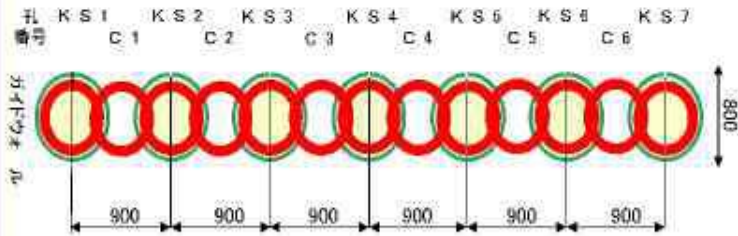


⑨ 地下ダム工事完成

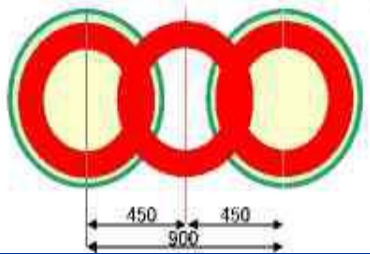
止水壁平面図

（SMW工法）





三軸削孔標準図

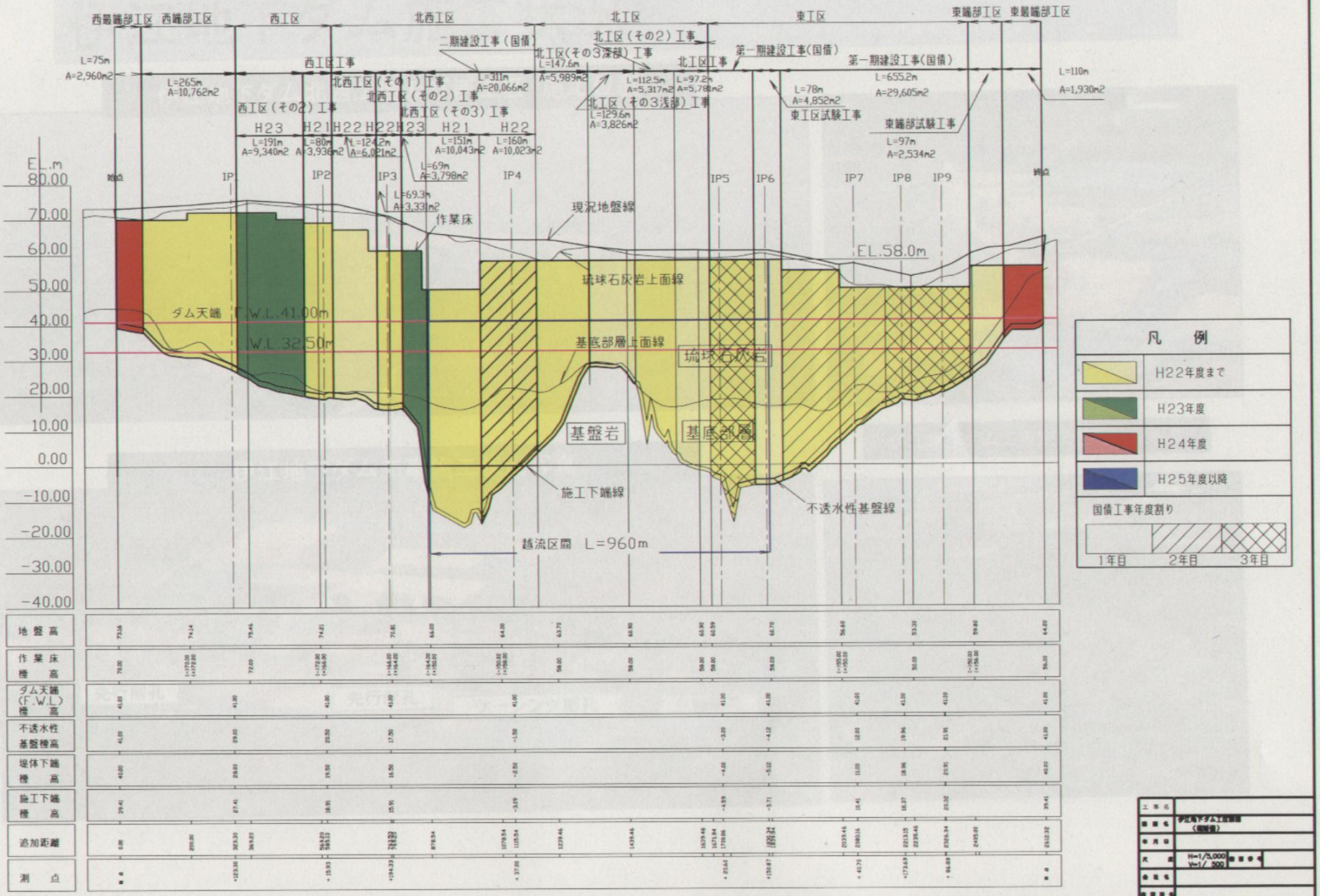


※施工は、基本的に奇数孔を先行し偶数孔を後追いとする。

**Model of Cut-off wall (Soil mixing wall method)

伊江地下ダム縦断図

H=1:5,000　V=1:500




Okinawa
National capital
City
International border
Province boundary
Primary road
0 15km
0 10Mi
127°45'
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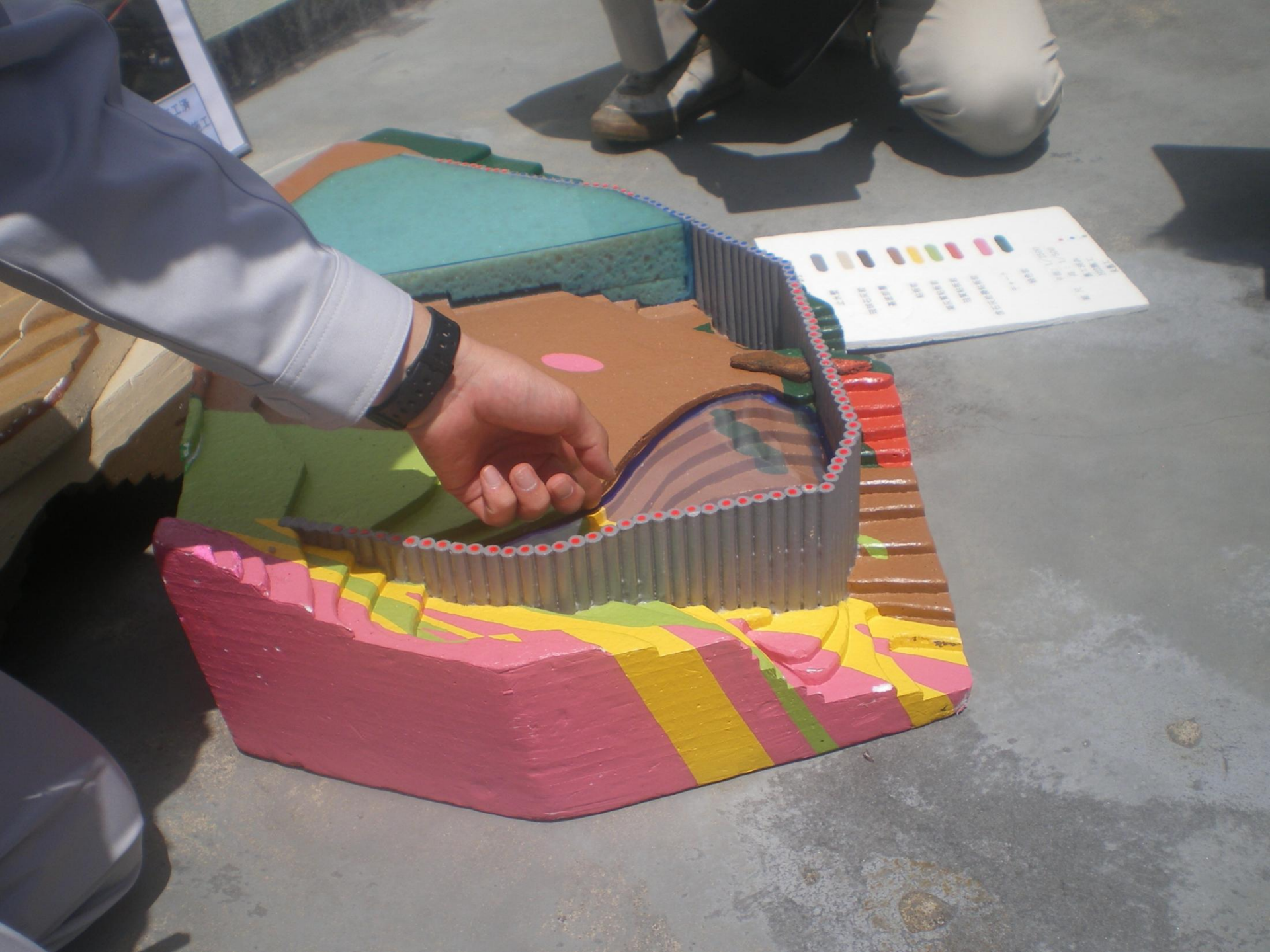
Tomigusuku
Yonabaru
Sashiki
Chinen
Tamagusuku
Itoman
Goshikami
N
Japan
China
North Pacific Ocean
Okinawa
South China Sea
Philippines


EV QUICK
CHARGING POINT


本図(平成23年度施工箇所)
凡例
:施工済
:H23施工
:未施工


(平成23年度施工箇所)
凡例
施工済
H23施工
未施工




安全帯を　使用せよ
吊り荷の下に入るな!


安全帯を　使用せよ
吊り荷の下に入るな！

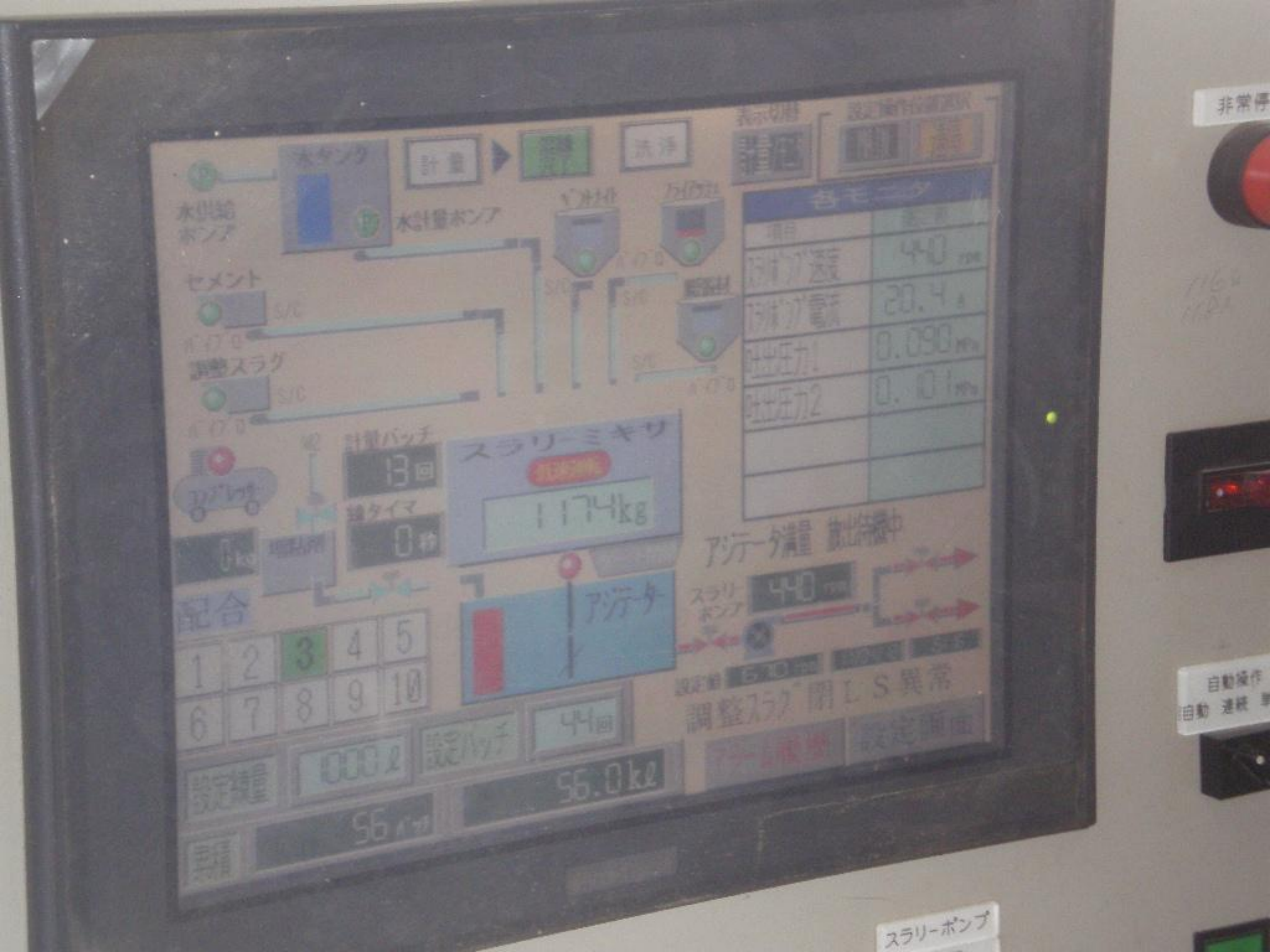

まず確認
の下に入るな!
NIPPON SHARYO
HITACHI


HITACHI


HITACHI

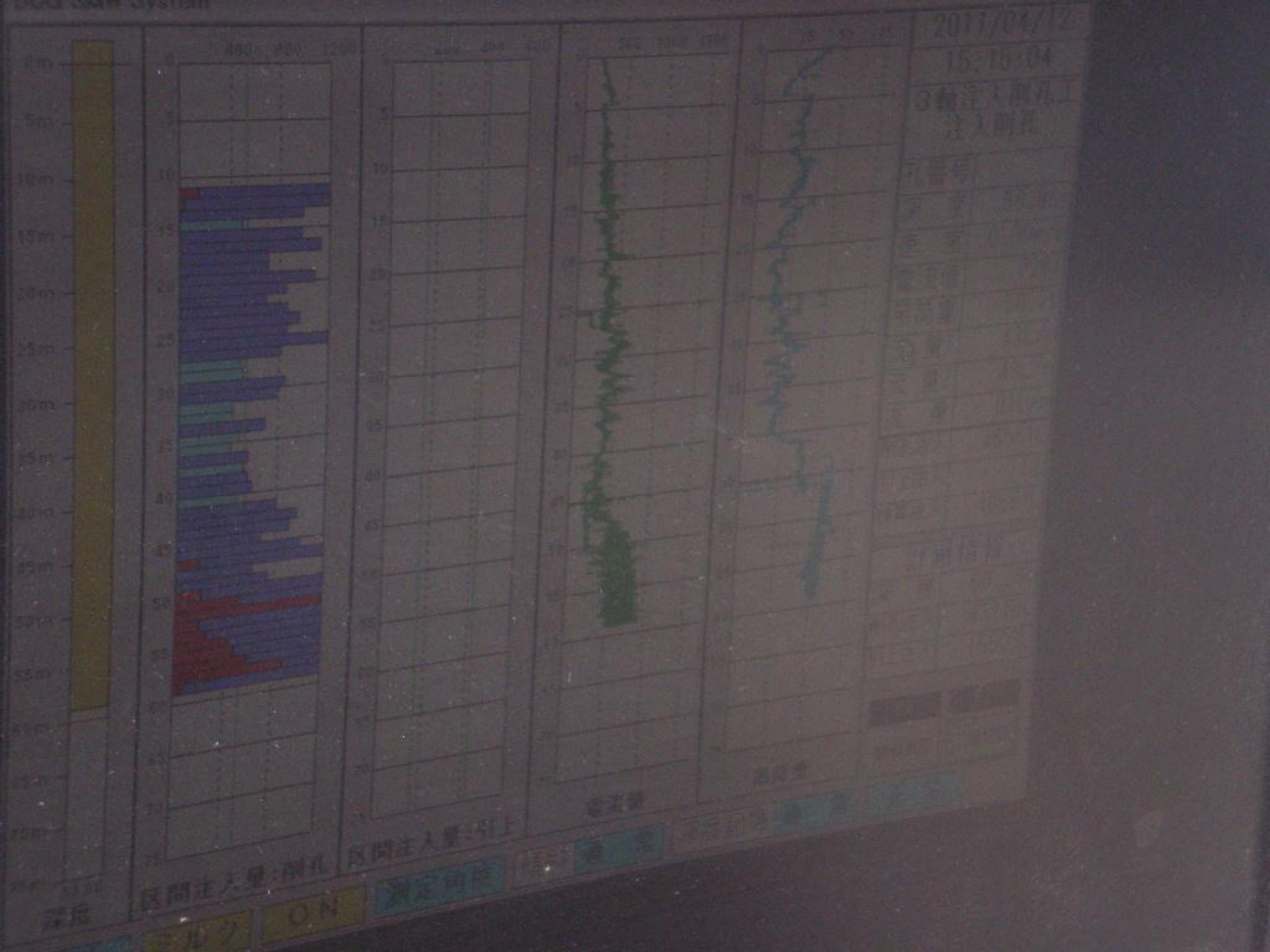

HITACHI


吊り荷の下に入るな



非常停
計量
洗浄
水タンク
水供給ポンプ
水計量ポンプ
セメント
調整スラグ
計量バッチ
13回
スラリーミキサ
1174kg
0秒
配合
1
2
3
4
5
6
7
8
9
10
44回
設定バッチ
1000ℓ
設定練量
56.0kℓ
各モニタ
スラリポンプ速度
440
スラリポンプ電流
20.4
吐出圧力1
0.090MPa
吐出圧力2
0.101MPa
アジテータ満量　吐出待機中
スラリーポンプ
440
アジテータ
調整スラグ閉LS異常
自動操作
自動　連続
スラリーポンプ


SyncMaster 740g
SAMSUNG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熊本501
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