

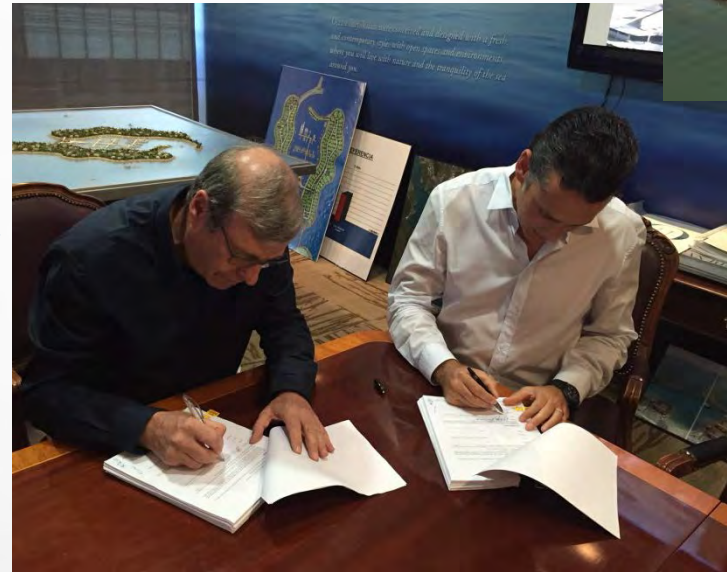
PUNTA PACIFICA – OCEAN REEF ISLANDS

PROJECT MANAGER BOSKALIS: SIMON OVERGAAUW
PRESENTATION WEDA:14-09-2016



1. HISTORY AND PROGRESS

- **1987: BOSKALIS IN PANAMA**
- **MARCH 2013: COMPLETION 1ST ISLAND**
- **JUNE 2014: MOU SIGNED**
- **MARCH 2015: SIGNED CONTRACT**
- **APRIL 2015: FIRST STONE CEREMONY**
- **MAY 2015: START MOBILISATION**
- **SEPT 2015 :START DREDGING**
- **OCT 2015: START ROCK PLACEMENT**
- **SEPT 2016: RECLAMATION WORKS (SAND)**
- **MAY 2017: COMPLETION DATE**
- **20XX : THIRD ISLAND????**



2. PROJECT IN NUMBERS

- 1 (STOP) SHOP
- 7 ROCK GRADATIONS
- 8 FOOTBALL FIELDS GEOTEXTILE
- 11 NATIONALITIES
- 12 VESSELS
- 140 PERSONS ON PROJECT
- 540 DAYS CONSTRUCTION
- 11,000 POKES VIBROCOMPACTION
- 57,000 ROCK TRUCK WEIGHT MEASUREMENTS
- 500,000 MAN HOURS (SO FAR)
- 1,300,000 M³ SAND
- >55,000,000 EUROS

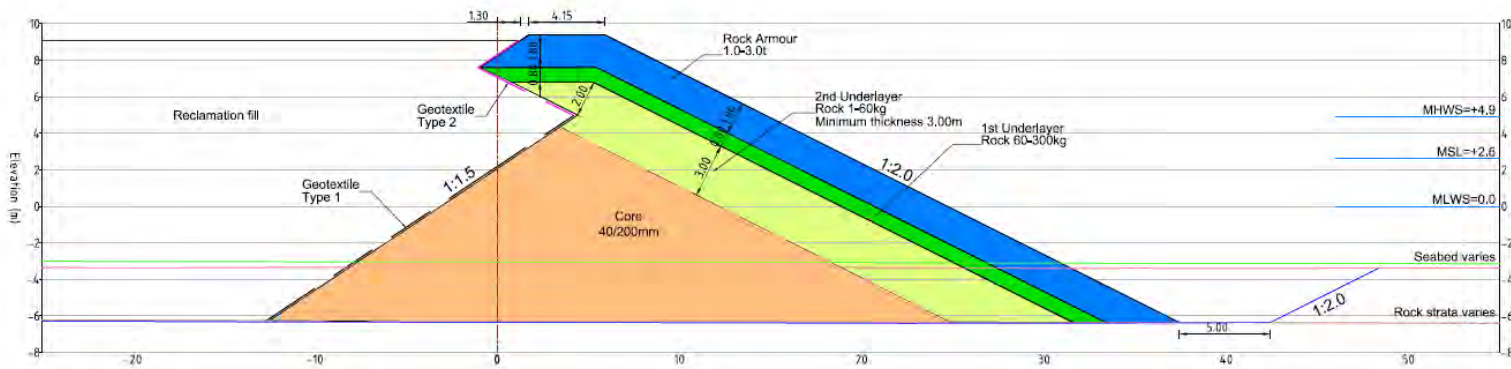
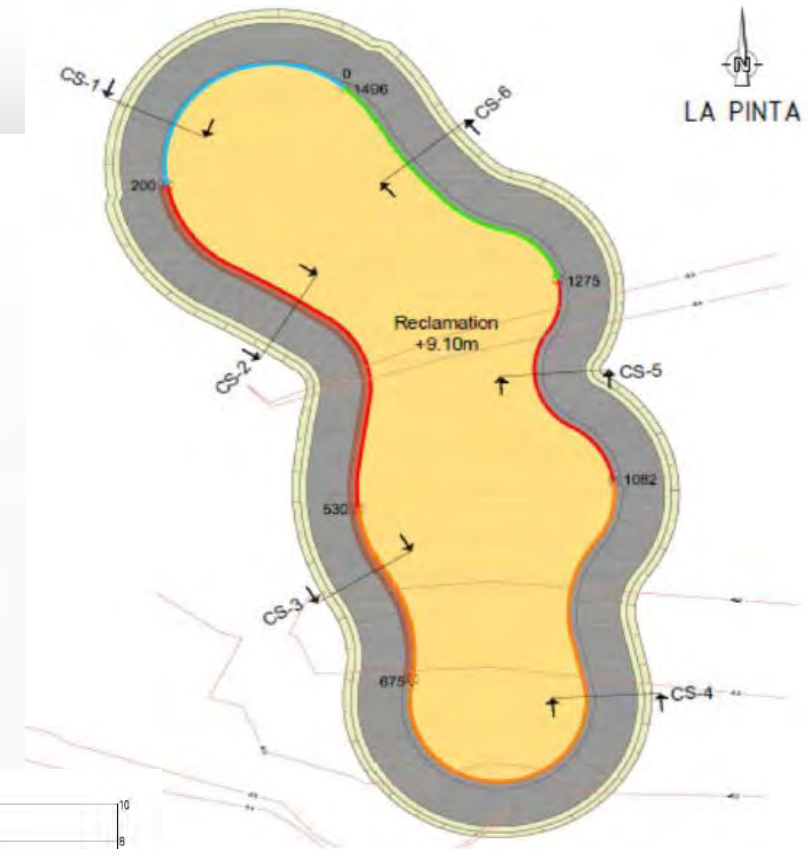


3. PROJECT LOCATION

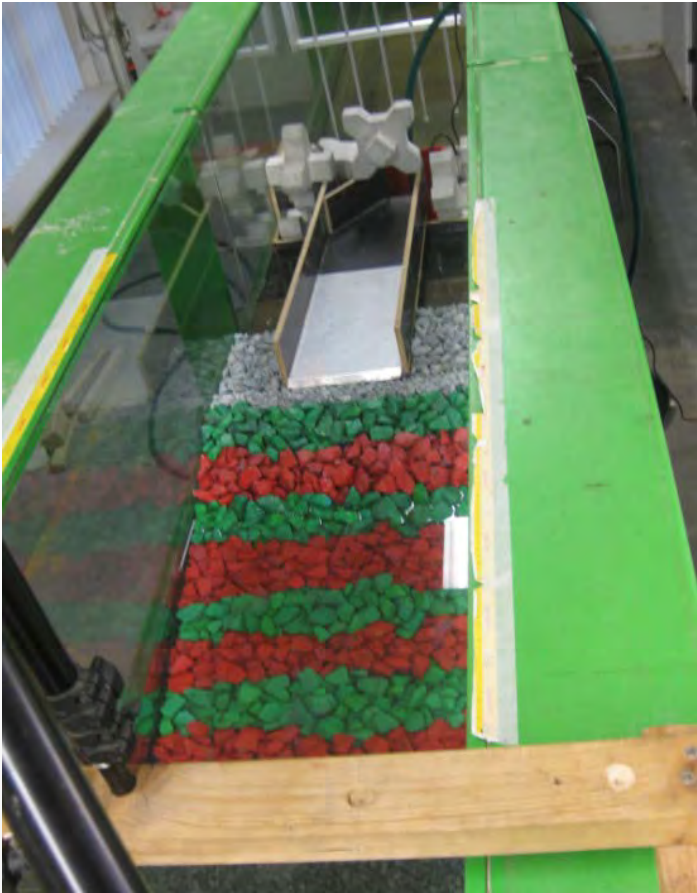


4. DESIGN

- PERIMETER OF NATURAL ROCK
- SIX DIFFERENT CROSS SECTIONS
- SEVEN TYPES OF ROCK GRADINGS



4. DESIGN CRITERIA



Direction	210°N		210°N Increased period		195°N	
Return period [yr]	Hs [m]	Tp [s]	Hs [m]	Tp [s]	Hs [m]	Tp [s]
1	2.3	16.0	1.9	18.0	1.9	13.0
10	2.7	17.0	2.2	19.0	2.2	14.5
100	3.1	18.0	2.5	20.0	2.5	16.0

- 1/100 yr swell condition
- Overtopping
- Sea level rise
- Settlement (long term)
- Liquefaction

FIVE MAIN PROJECT PHASES

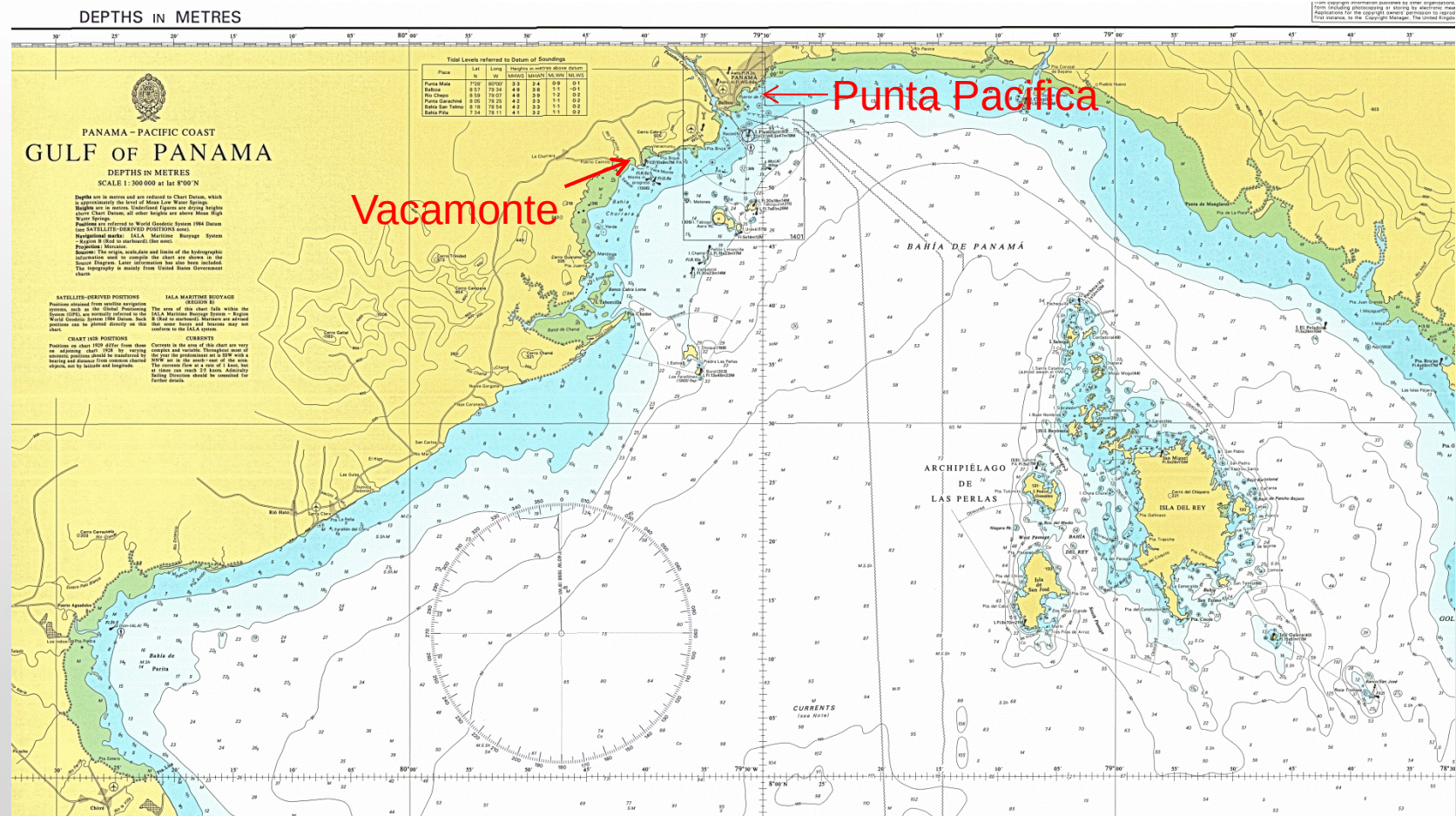
1. DREDGING UNSUITABLES
2. ROCK PLACEMENT
3. INSTALLATION GEOTEXTILE
4. RECLAMATION WORKS
5. VIBRO COMPACTION

ACTIVITY 1: DREDGING UNSUITABLES

- Soft sediment
- Backflow material
- Parallel planning
- Equipment choice



ACTIVITY 2: ROCK PLACEMENT

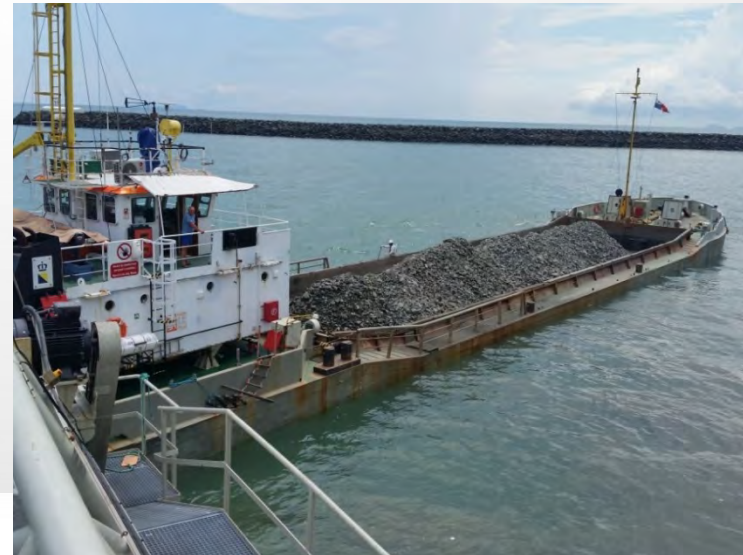
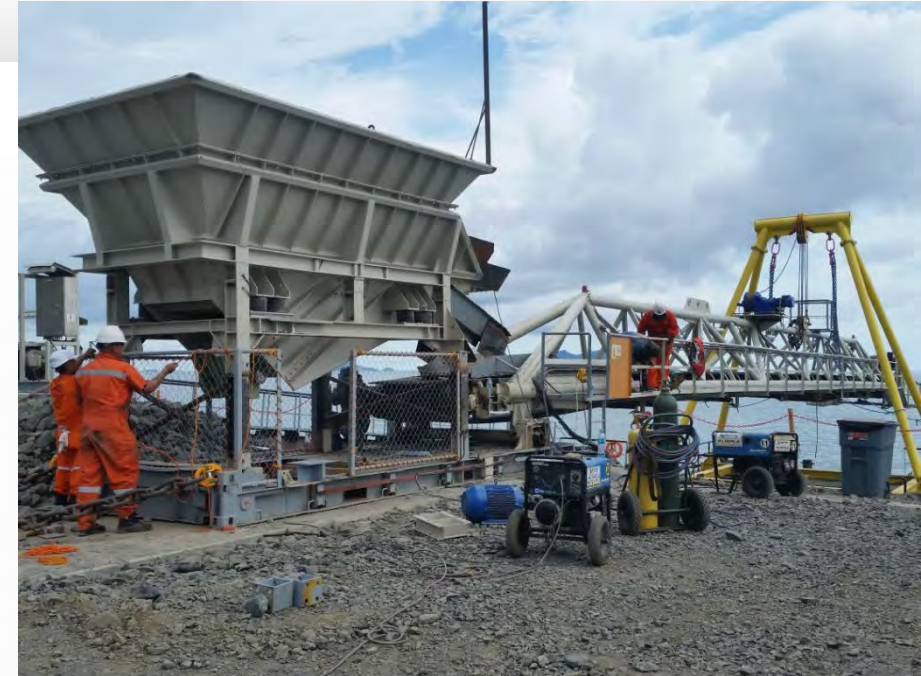


ACTIVITY 2: ROCK PLACEMENT

Rock Loading Facility Vacamonte



- Limited space
- Loading core via conveyor belt in SHB's
- Flattop barge loading with wheelloaders

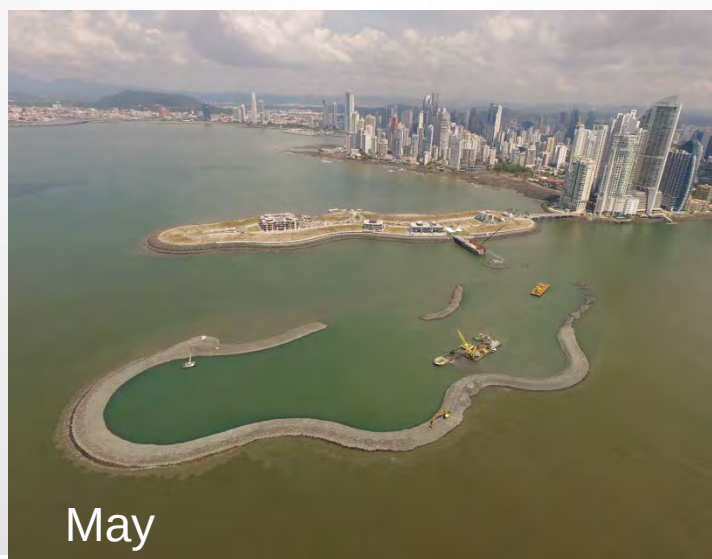
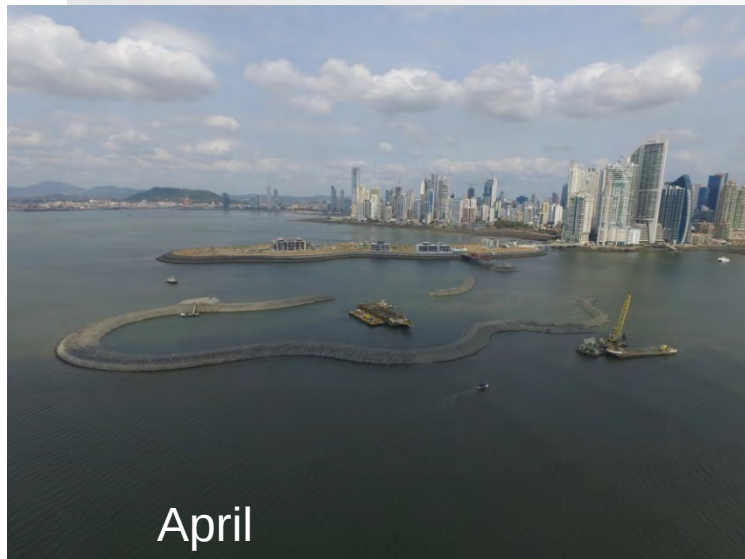
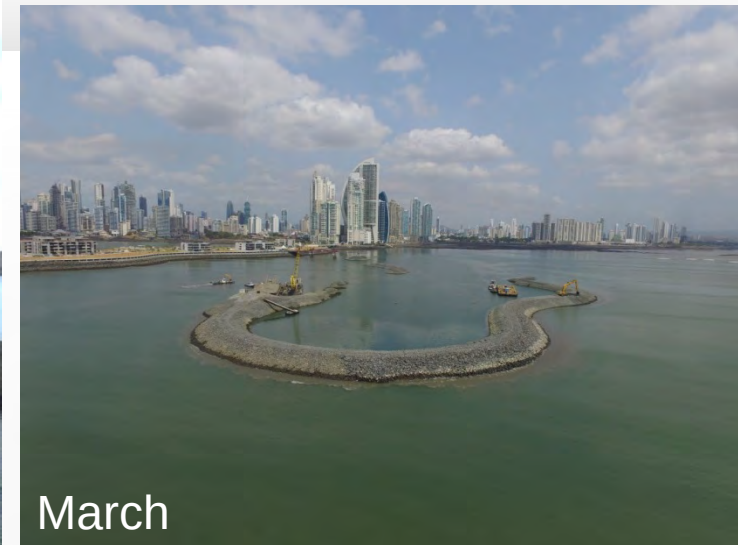
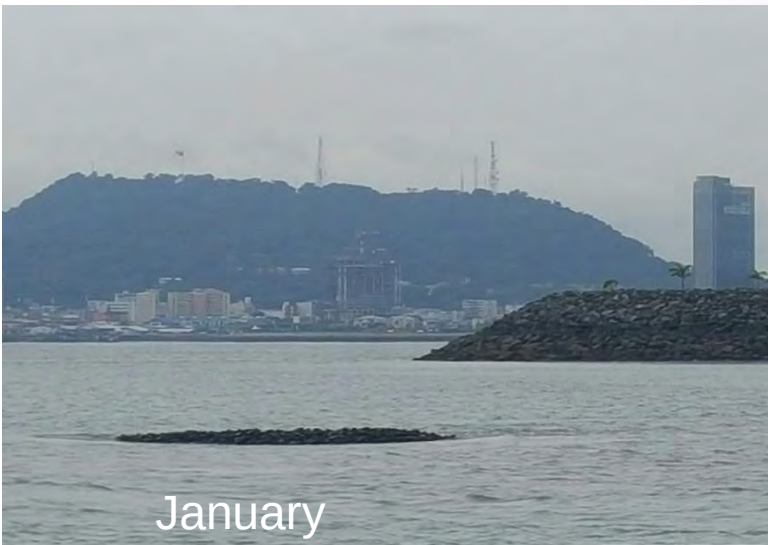


ACTIVITY 2: ROCK PLACEMENT

Dumping – Placing - Profiling



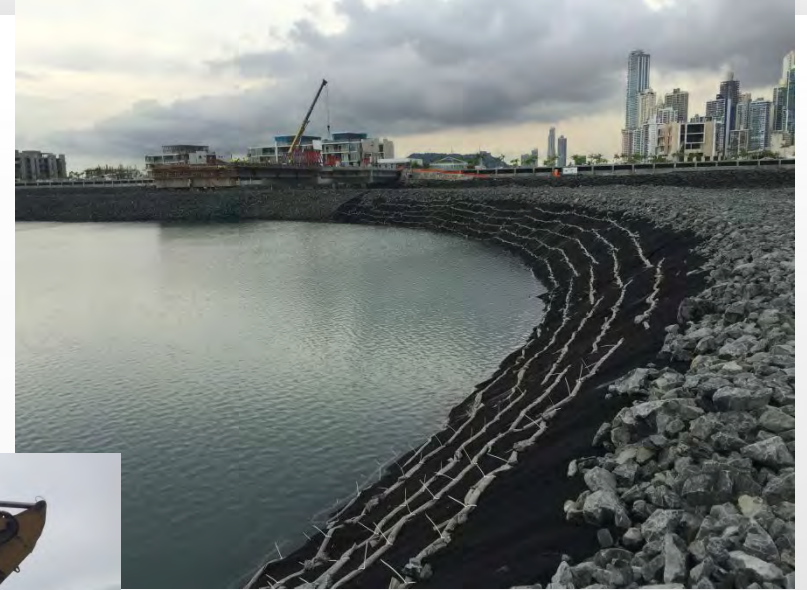
ACTIVITY 2: ROCK PLACEMENT



ACTIVITY 3: GEOTEXTILE PLACEMENT



From +4m level

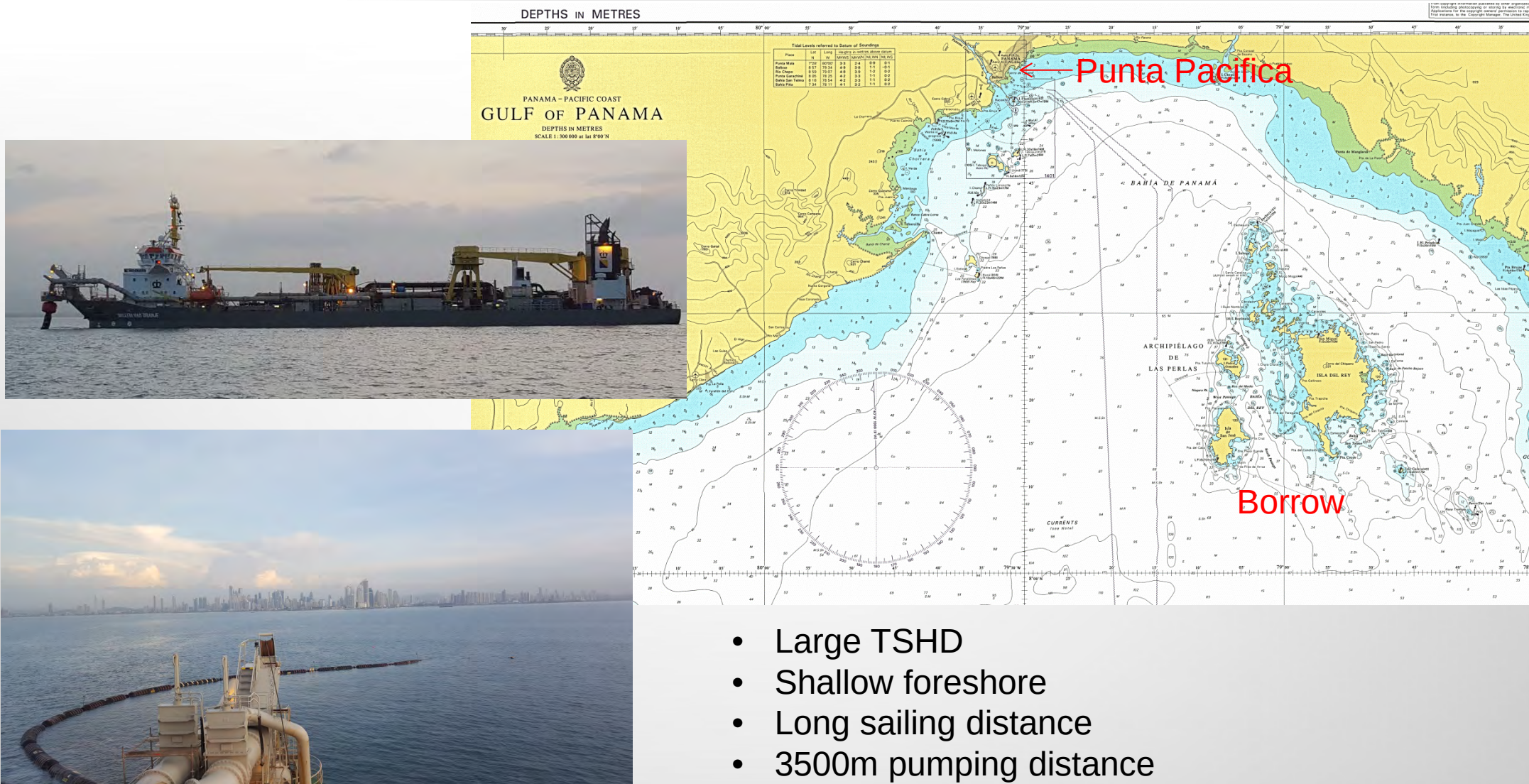


Rolling



Pre ballast

ACTIVITY 4: RECLAMATION WORKS



- Large TSHD
- Shallow foreshore
- Long sailing distance
- 3500m pumping distance

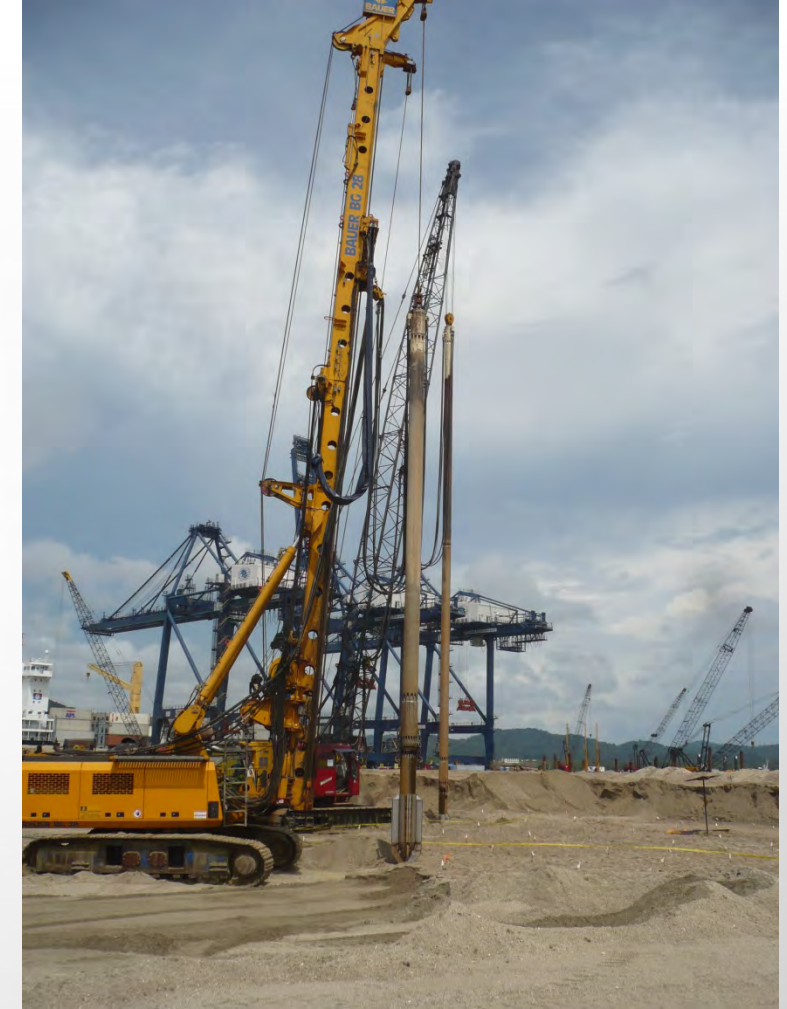
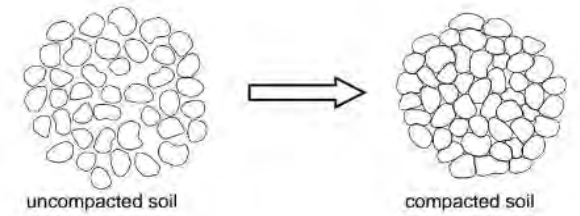
ACTIVITY 4: RECLAMATION



- Progress sept 9th
- Prioritize on North half



ACTIVITY 5: COMPACTION



- Vibro flotation compaction
- Earthquake resistance
- Last activity before completion

Questions.....

