PORT&TERMINAL Technology 2016

8th International Conference & Exhibition USA

Charleston, SC, **United States**

Design and Development of Mexico's Tuxpan Port Terminal

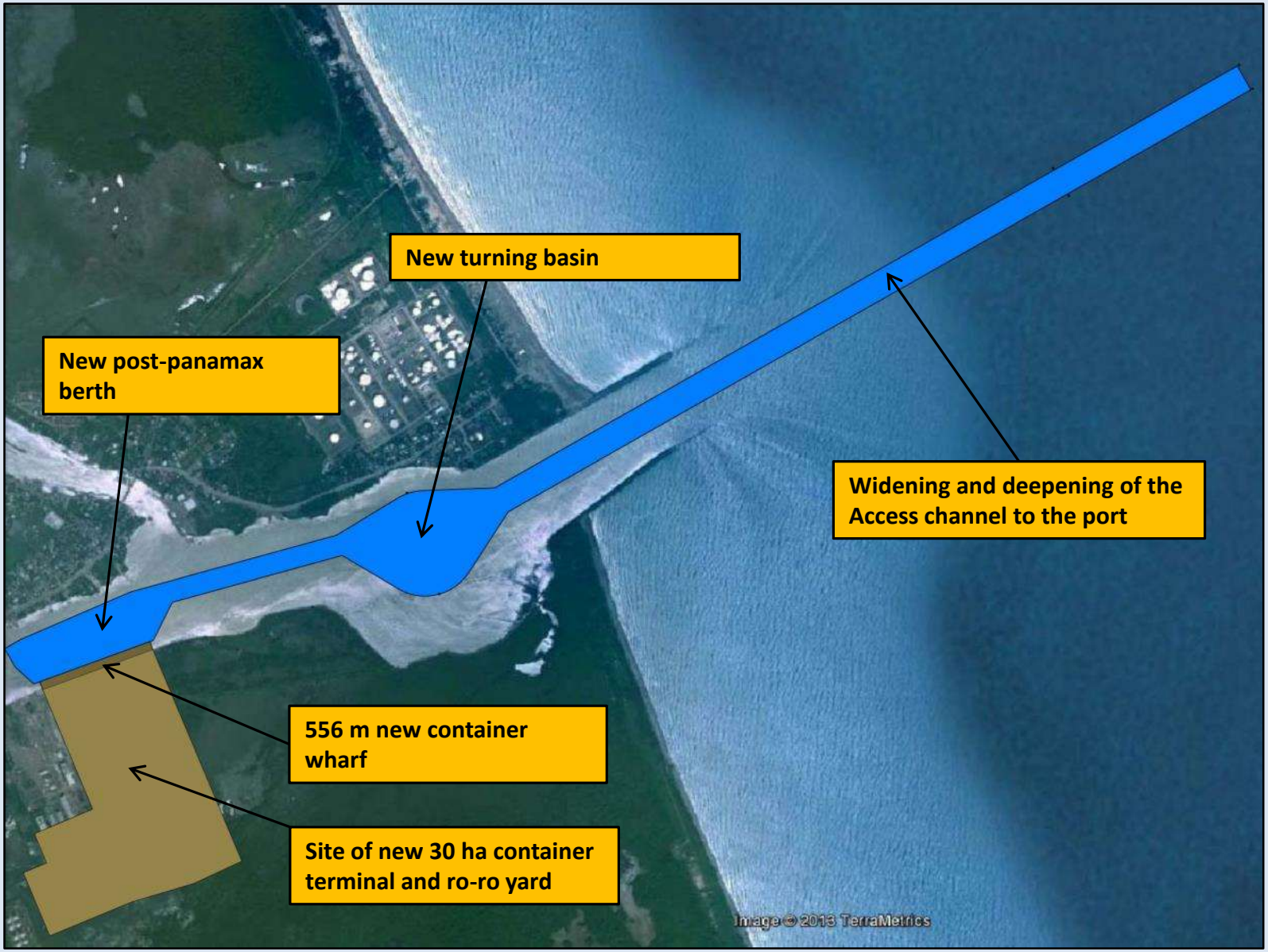
John Bardi, PE

BergerABAM

Global Location

Proximity to México, D.F.

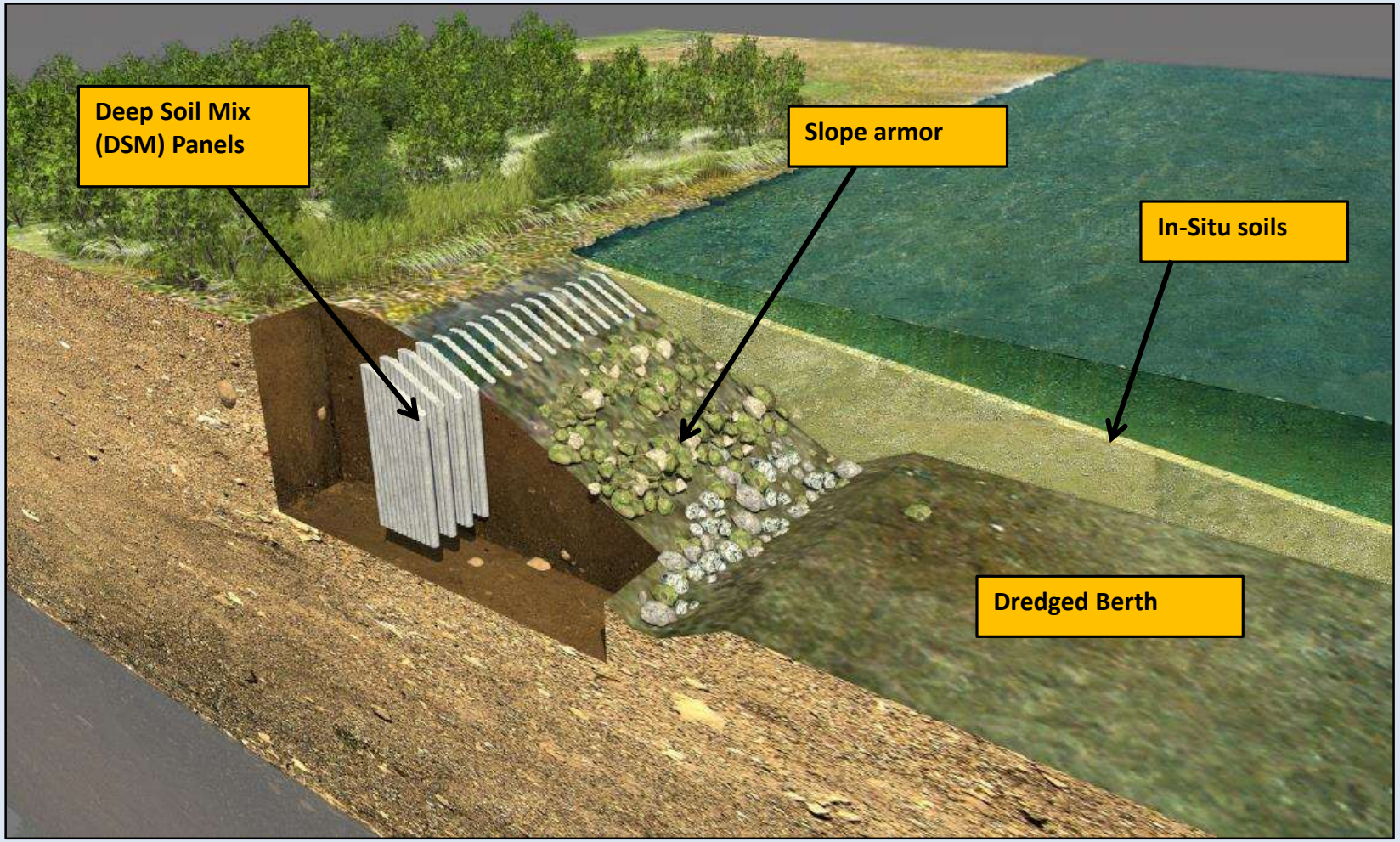
Project Elements



Phase 1 Container Terminal

Pile-Founded Marginal Wharf

Slope Stabilization

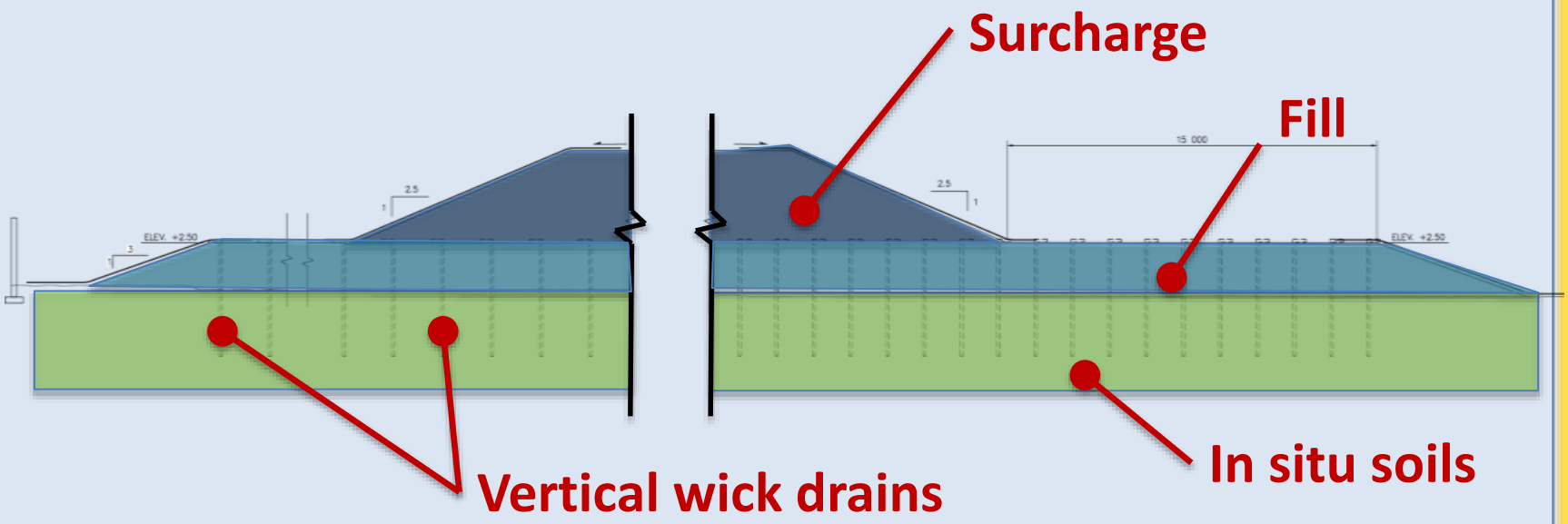


- Instability of the slope at the riverside
  - *Soil Cement Improvement*

Multi-Axis Deep Soil Mixing

Completed Soil-Cement Panels

Upland Compressible Soils



- 4.5m surcharge with wick drains
- 1.2 Million m^3 fill and surcharge from land sources
- Surcharge transferred between different zones after 90% consolidation achieved in each zone

Vertical Drains & Surcharge

Environmental Restrictions

- Environmental conditions of the site due to the protected mangrove area at the riverbank
  - *Unique footprint to preserve sensitive areas*

Environmental Restrictions

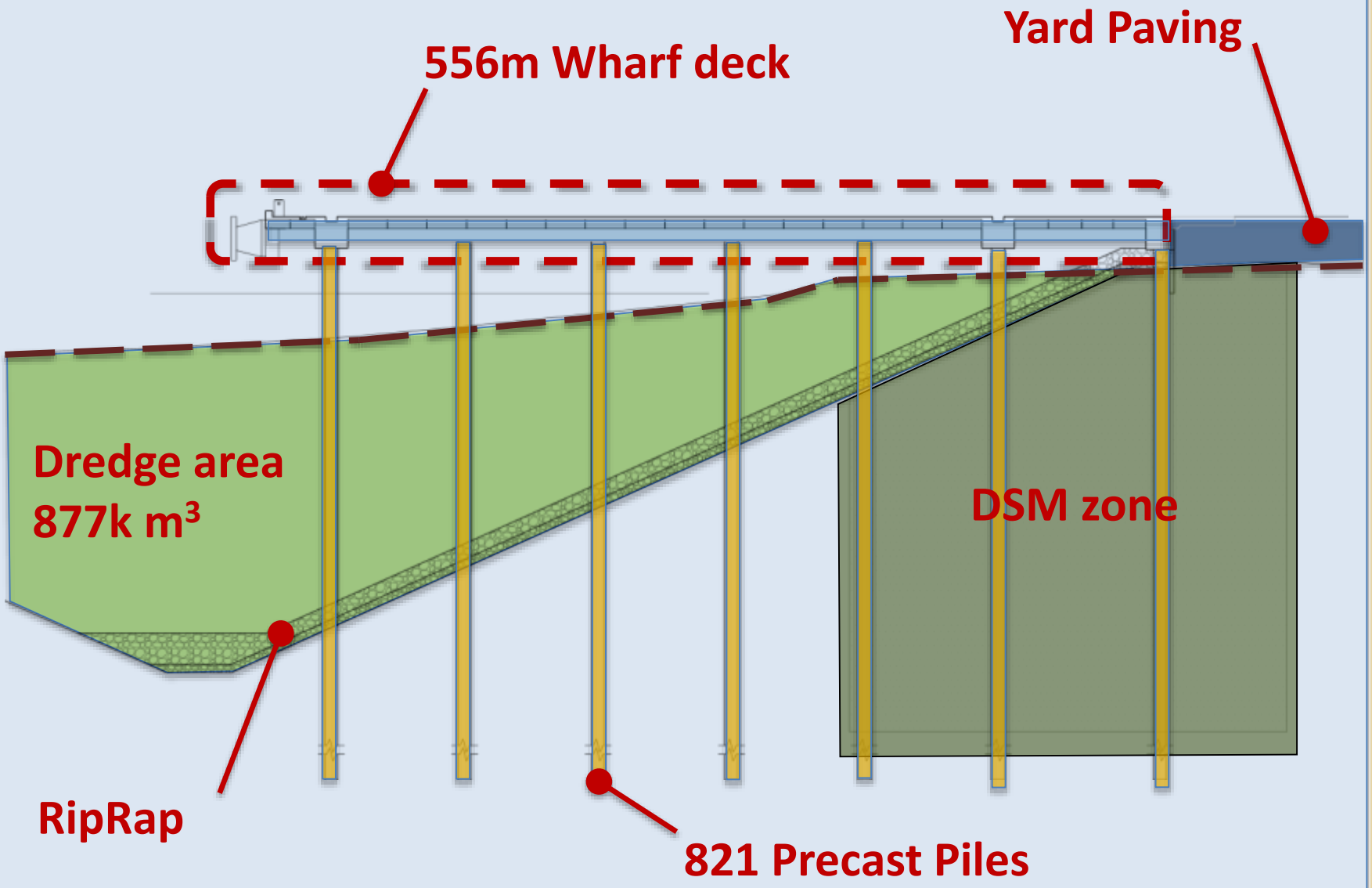
Open space for movement of water behind wharf

Mangrove Conservation area

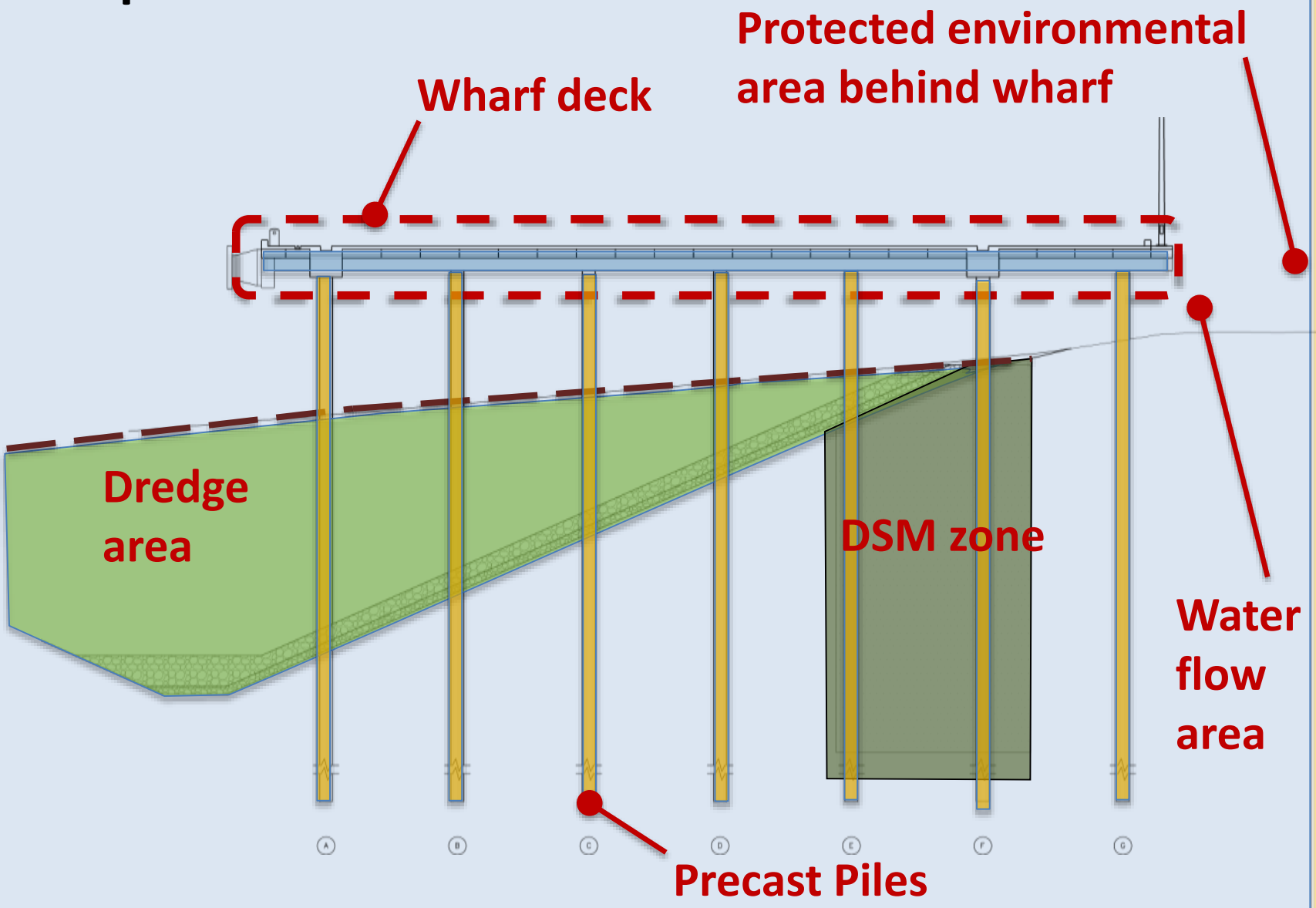
Completed Wharf structure

Environmental Restrictions

Marginal Wharf



Open Wharf

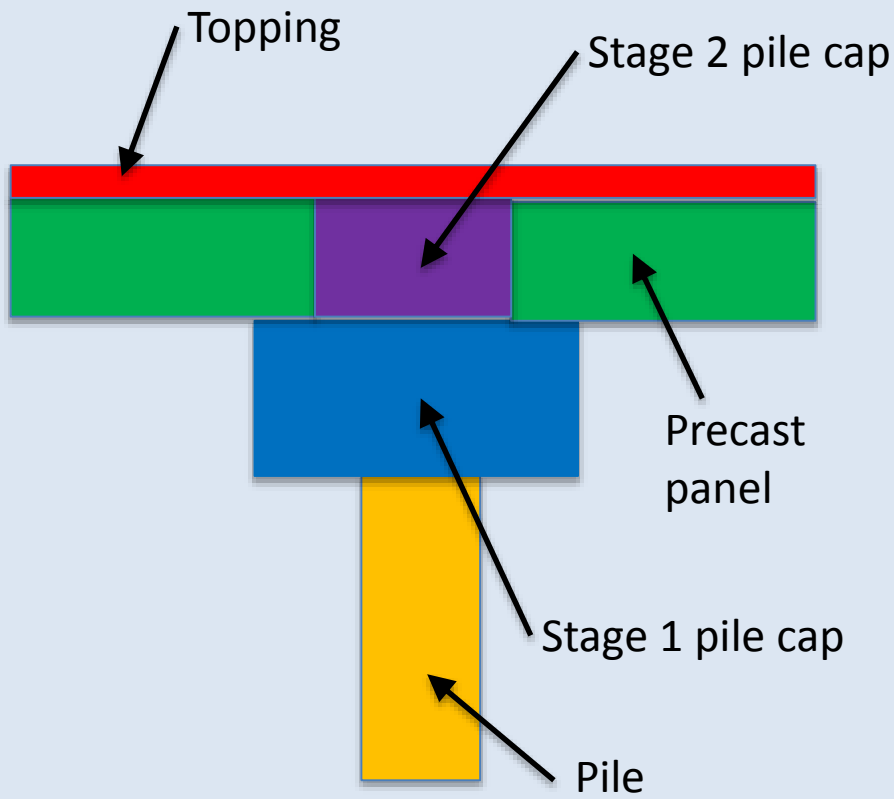

Protected environmental area behind wharf
Wharf deck
Dredge area
DSM zone
Water flow area
Precast Piles

Precast Piles

- Hollow piles to reduce weight
- Capacity verified by static test pile program with PDA tests (CAPWAP)

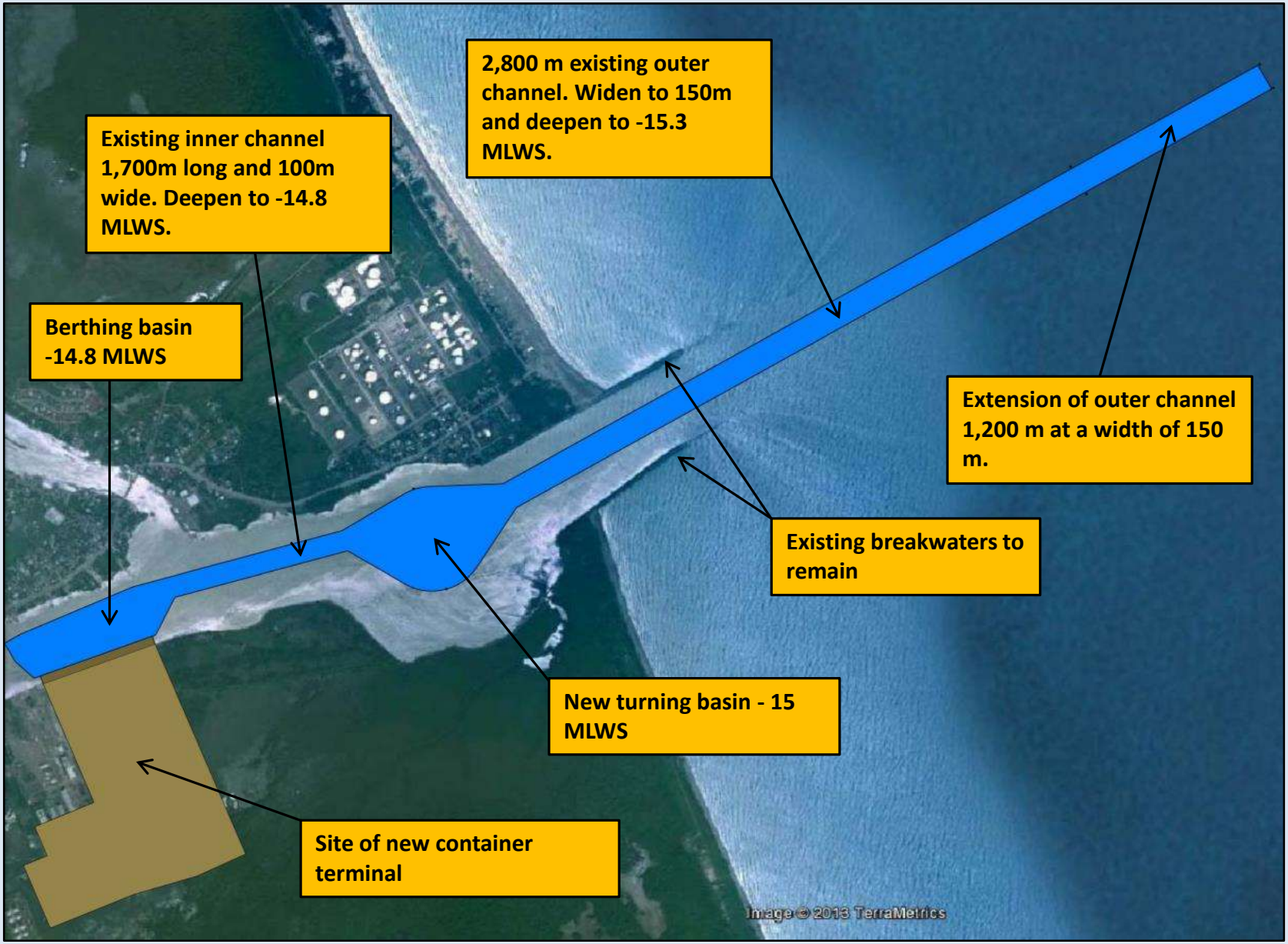
Wharf Construction Sequence

- Stage 1 – CIP pile cap
- Placement of precast concrete deck panels
- Stage 2 – CIP pile cap closure pour
- CIP topping slab

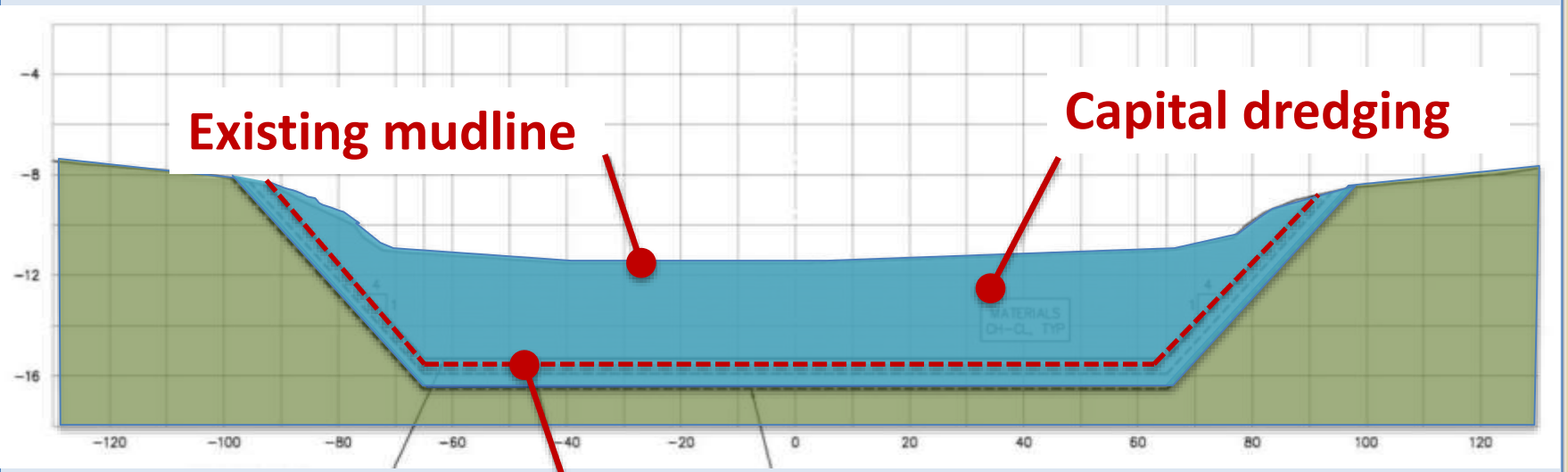


Wharf Construction Sequence

Channel Improvements

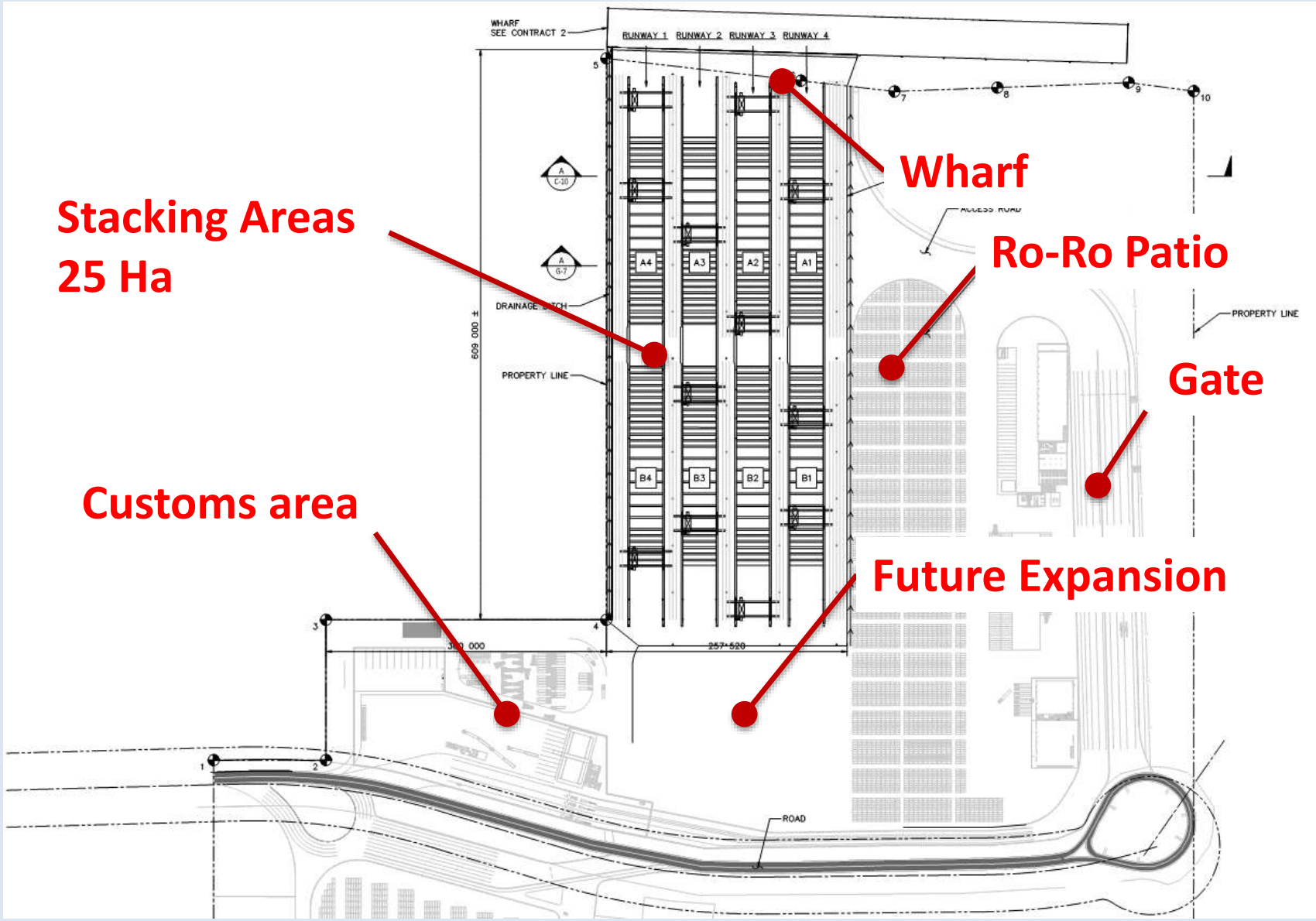


Typical Dredge Section



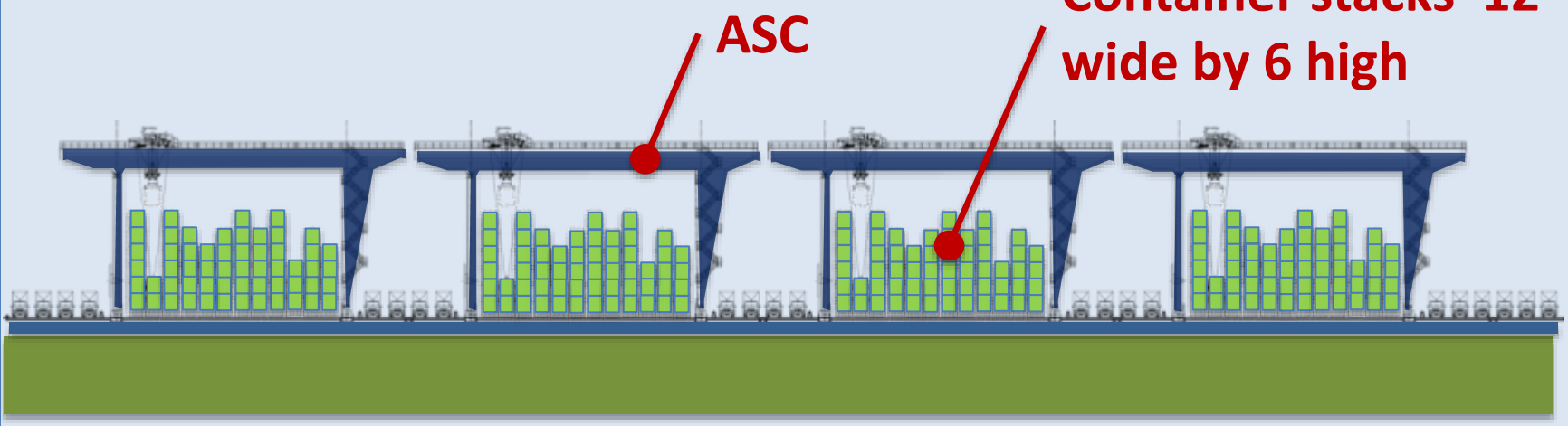
3.5 meters Outer Channel Deepening

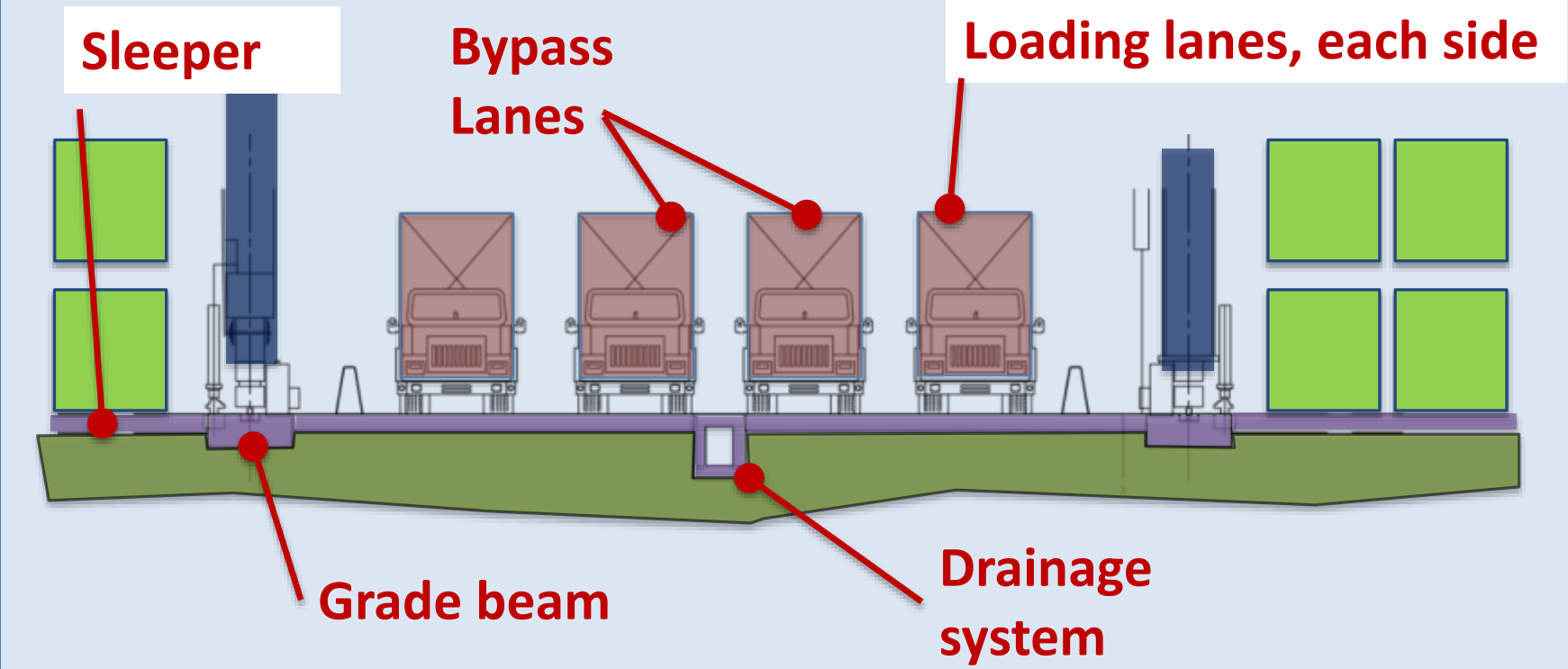
Container Yard



PORT & TERMINAL Technology 2016

Container Yard Section





Container Yard Grade Beam System

Typical Container Yard Details

Thank You