Urban Problem Solver :
Taipei Port Reclamation Project

TIPC 臺灣港務股份有限公司基隆港務分公司
Port of Keelung, Taiwan International Ports Corporation, Ltd.

Urban Problem

Construction Surplus Soil

The northern region of Taiwan is densely populated, making it difficult to obtain land for filling Construction Surplus Soil.

Basic Oxygen Furnace (BOF)

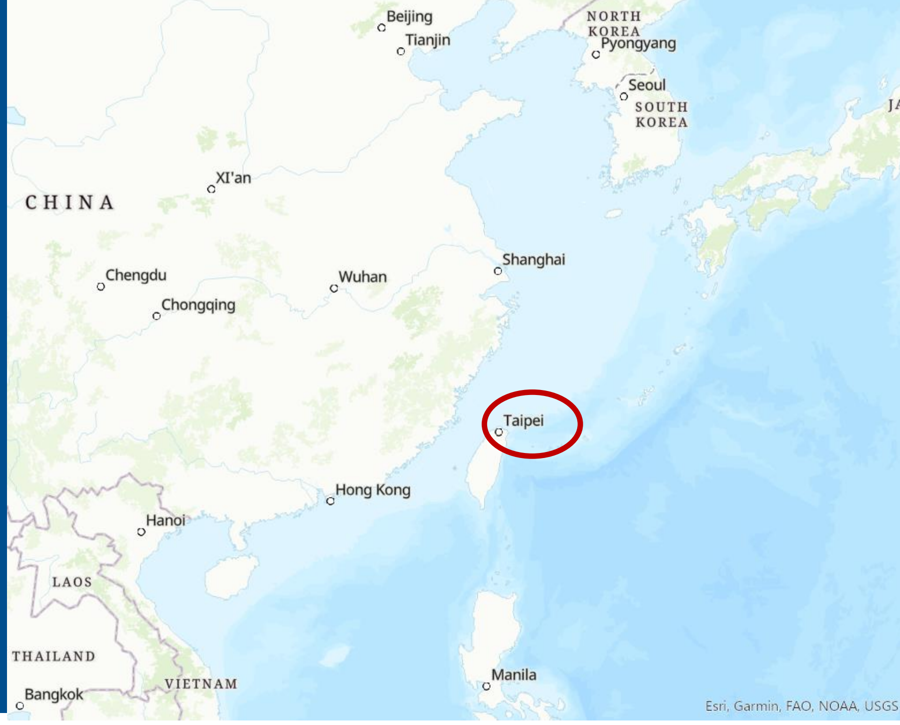
The application ways of Basic Oxygen Furnace (BOF) slag are restricted, which seriously affects the operation of steel industry.

Solution ?

City governments need a place to become the application field of Construction Surplus Soil and Basic Oxygen Furnace (BOF) slag to achieve the purpose of reducing environmental pressure and saving costs.

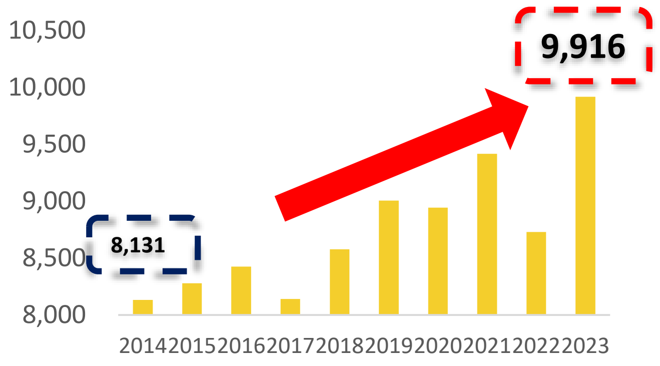
Taipei Port

A New-Generation Port

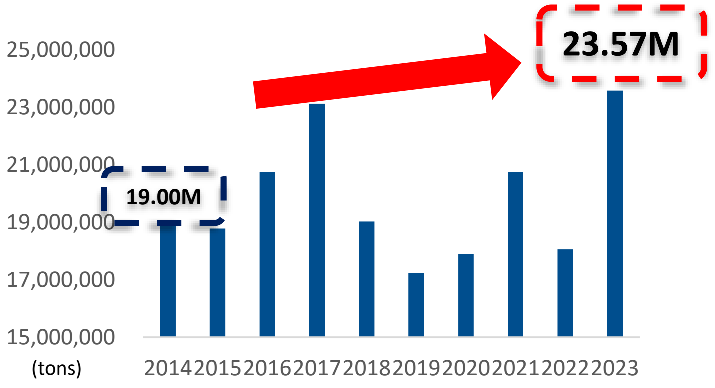


- Taipei Port is a new-generation port. It is expected to become the biggest port in northern Taiwan, listed with Kaohsiung Port in the south as the two biggest transshipment hubs.

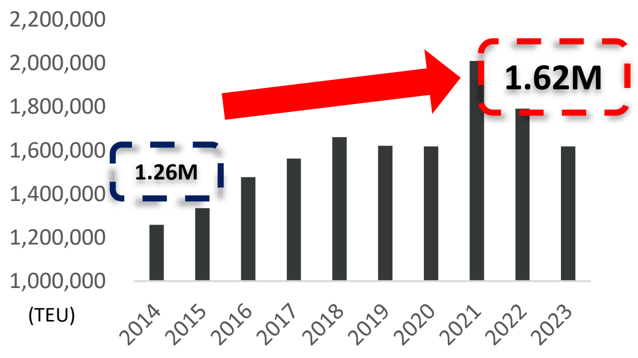
- The total number of ships arriving and departing the port, container loading and unloading volume, and cargo throughput are growing year by year.



Total number of ships arriving and departing the port



cargo throughput



Container loading and unloading

- The port land is limited, in line with national policies, TIPC plans to expand the port and provide related industries into the location.
- Taipei Port Reclamation Project requires excavation of a large amount of sand and gravel.

Taipei Port and local government work together to propose solutions.

Taipei Port Reclamation Project

North Pier Logistics Warehousing Area Construction Surplus Soil Accommodate Operation

This project will be implemented in four phases. It is expected that from 2012 to 2037, it will accommodate 73.25 million cubic meters of Construction Surplus Soil and produce 339 hectares of new land.

Phase 2 (Complete)
Period: 2016 to 2023
Results: Contained 28.28 million cubic meters of soil

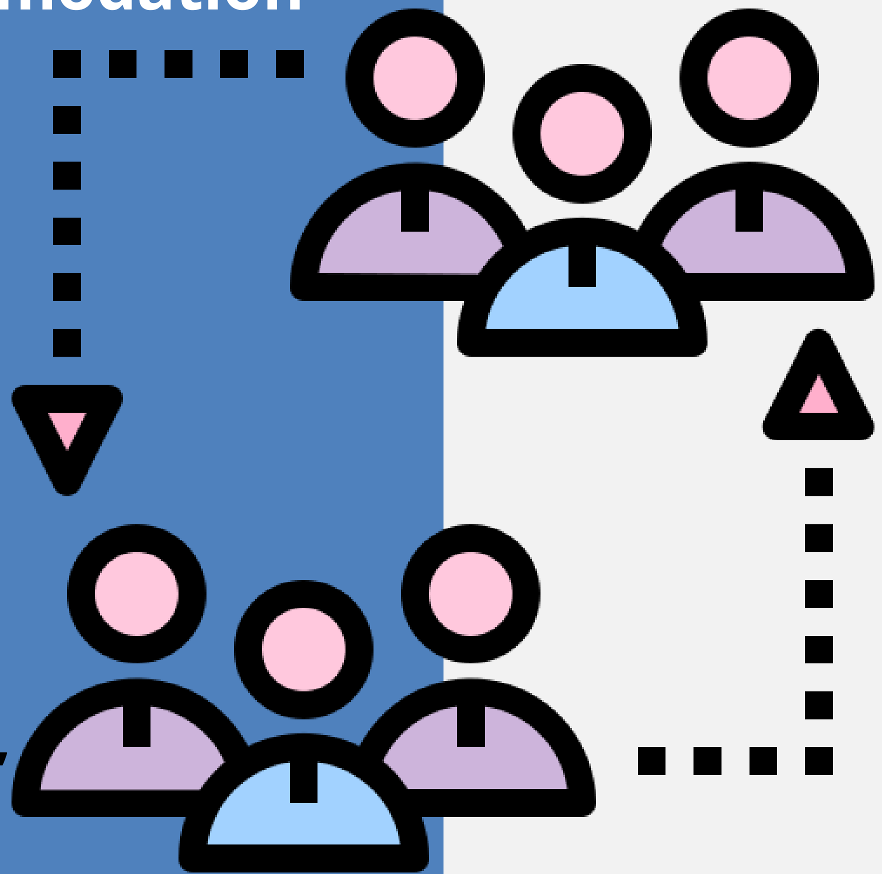
- Land Transporting 25 million cubic meters of Construction Surplus Soil
- Shipping 1.6 million cubic meters of Construction Surplus Soil
- Shipping 1.68 million cubic meters of BOF slag (including the part of Phase 3 & 4 slag stacking)

Phase 1 (Complete)
Period: 2012 to 2016
Results: Contained 10.83 million cubic meters of Construction Surplus Soil

Phases 3 & 4 (construction in progress)
Period: 2024 to 2037
It is expected to accommodate 34.14 million cubic meters of Construction Surplus Soil

Construction Surplus Soil accommodation management mechanism

In order to avoid illegal disposal, Taipei Port has built a **Construction Surplus Soil Exchange Operation Platform** so that the excavation agency and soil accommodation agency can communicate with each other.



The excavation agency made a request for accommodation.

- Responsible for excavated soil quality and transportation management.
- Excavated quality confirmation, transportation route inspection, vehicle tracking, and avoidance of soil replacement midway.

Soil accommodation agency confirms accommodation capacity.

- Responsible for land collection management.
- Confirmation of quality of collected soil, verification of vouchers, verification of quantity, and proof of accommodation application.

臺北港物流倉儲區第二期造地工程-土方交換管制及推整委託專業服務(第二標)

車輛進場紀錄表

工程名稱	新北市林口區建林段 392 地號林口媒體園區(B 基地)東森全球集團全球營運總部新建工程				
主辦單位	新北市政府經濟發展局			工程流向編號	LVA04632
承攬廠商	地樺營造事業股份有限公司			收容場所編號	EVA13657
清運業者	馨鍊達工程有限公司			駕駛姓名	林正展
車頭號碼	LAF889	車尾號碼	HBA3533	進場數量(m3)	12.00
出土端時間	2023/02/15 14:10			土質	B2-3
車辨端時間	2023/02/15 14:59			過磅重量	
收土端時間	2023/02/15 15:08		離場時間	2023/02/15 16:15	

車辨站照片

車頭	車尾

檢查站照片

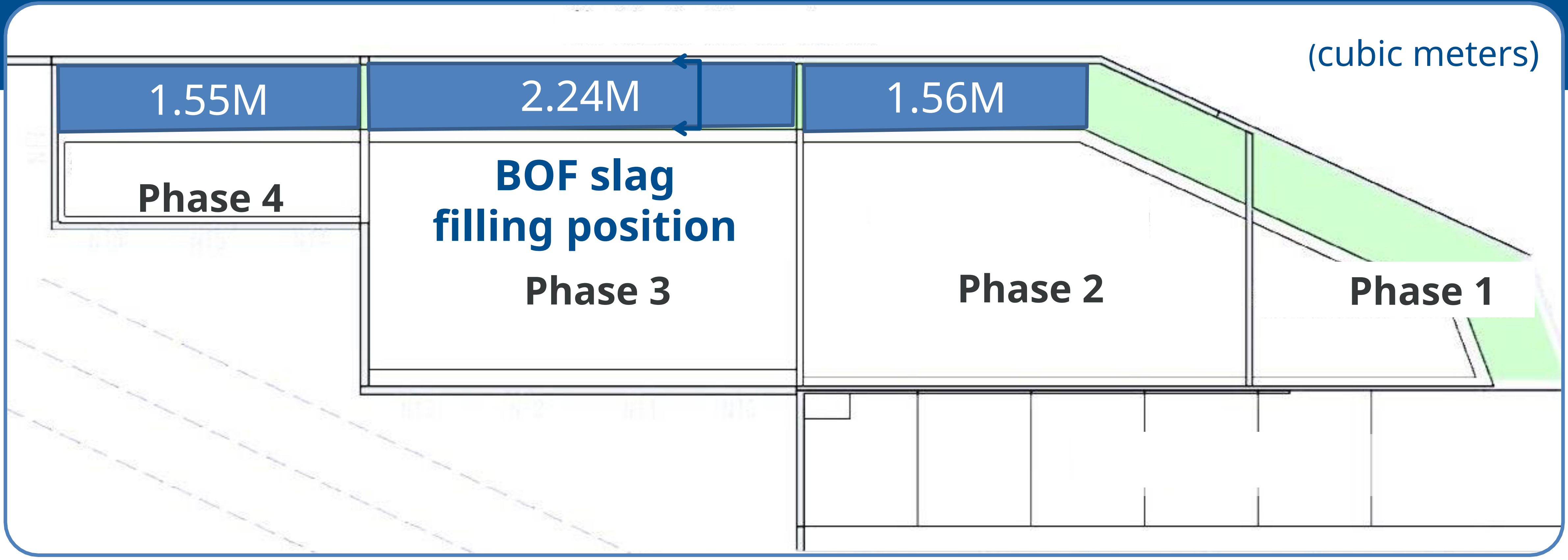
車頭	車斗
2023-02-15 15:09:00 10) 收單-車頭	2023-02-15 15:09:00 11) 收單-車斗

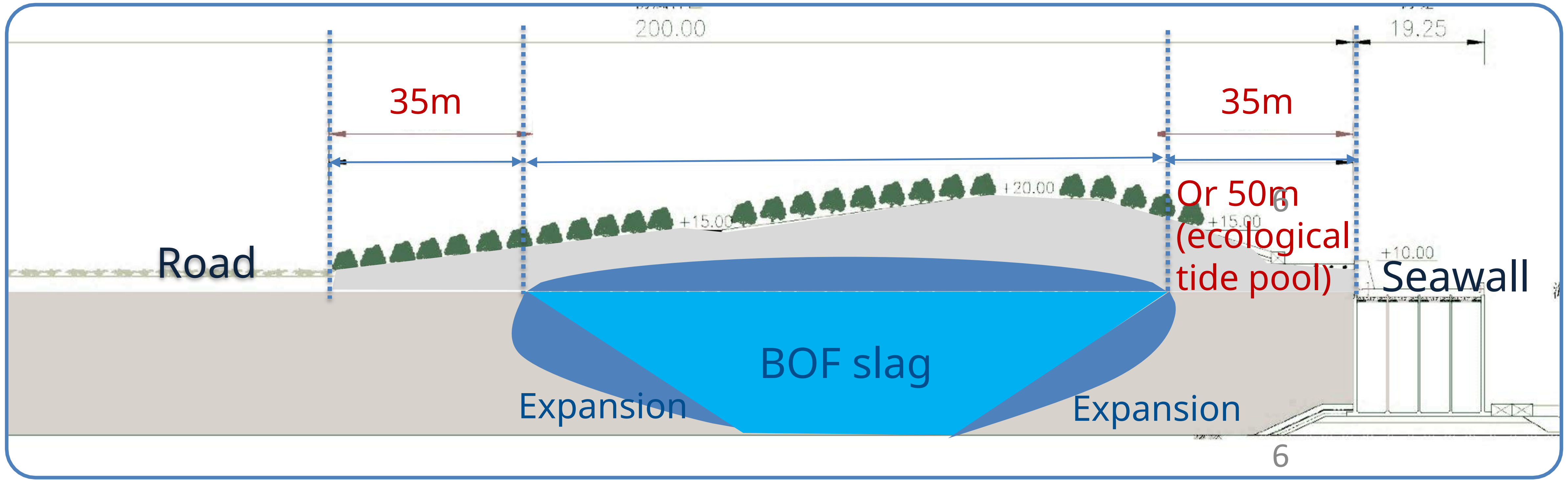
Taipei Port Logistics Warehousing Area Construction Surplus Soil Exchange Operation Platform

Taipei Port and Steel industry work together to propose solutions

Taipei Port Reclamation Project

BOF slag Recycling and Reuse Planning





- The phase 2 to 4 are expected to fill **5.35 million cubic meters of BOF slag**, which is expected to **reduce carbon emissions by 38,000 tons**.
- BOF slag has the property of expansion, so windbreaks are planted on the upper layer for reinforcement. It is expected that **43 hectares of windbreaks** will be planted to **absorb 34,000 tons of carbon dioxide**.

Basic-Oxygen-Furnace (BOF) slag

Test & Supervision mechanism

**In order to reduce public doubts, Basic-Oxygen-Furnace (BOF) slag has been tested.
And ensure that the transportation process complies with regulations.**

Filling test

- Environmental monitoring (sea water quality, sea sediment) before and after filling are all in compliance **with standards**.
- The research has confirmed that Basic Oxygen Furnace (BOF) slag is **suitable for utilizing as fill material for land reclamation**.

Supervision mechanism

Material preparation and quality control

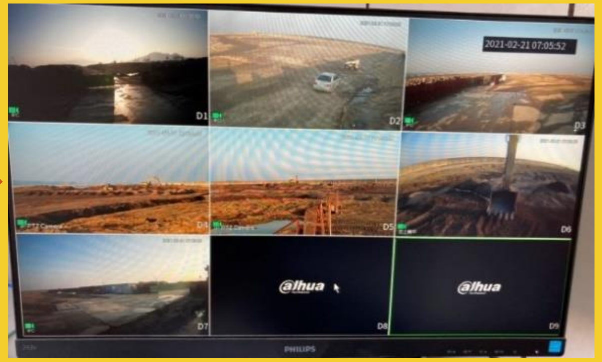
Shipment and land transportation GPS monitoring

The dock loading operation confirms that there is no mixing of materials

Shipping AIS monitoring

Inspection of dock unloading operations confirms no mixed materials

Unloading land transportation GPS monitoring



Full video recording of the reclamation area

Special project vehicle marking control

Check that there is no mixed material in the filling area

Economic and environmental benefits cost savings and carbon emissions reduction

Port authority - TIPC

- The original plan was to complete the filling in 2045, but it was 8 years ahead of schedule and completed in 2037.
- Reduce 1.4 billion US dollars (44 billion NT dollars) in filling costs and 275,000 tons of carbon emissions.

City governments

- There are currently 34 soil materials depots in 4 cities, with a collection capacity of 21.36 million cubic meters.
- In 2022, the Construction Surplus Soil has reached 22.36 million cubic meters in 4 cities, which is often transported to other places.

Steel industry- CSC

- Removing 5.35 million cubic meters of BOF slag, which is expected to reduce carbon emissions by 38,000 tons.


bsi.

Opinion Statement

On the whole

- **Total carbon emissions reduction**

275,000 tons from dredging vessels (replaced with Construction Surplus Soil)
+38,000 tons from dredging vessels (replaced with Basic-Oxygen-Furnace slag)
=313,000 tons of carbon emission reduction

- **Total carbon sequestration**

34,000 tons of carbon dioxide (absorb by Windbreaks plant)

- **Total cost savings**

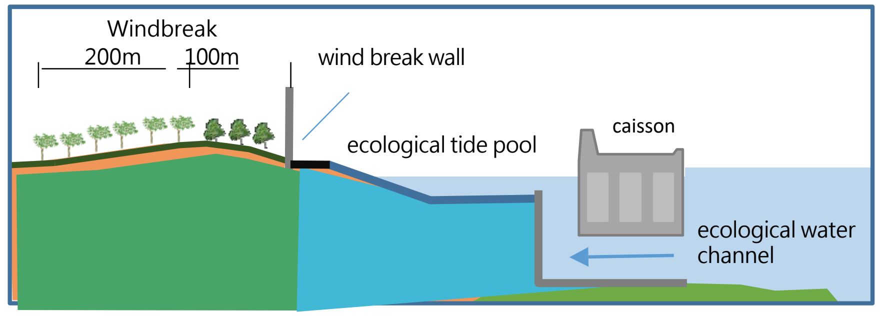
1.4 billion US dollars (44 billion NT dollars)

Taipei Port relieves pressure on City governments and Steel industry !

Economic and environmental benefits

Ecological buffering and community communication

Ecological tide pool



The design of the tide pool elevation will take into account the average daily difference between the high and low tides of the Taipei Port about 2 m, so that **creatures can stay or feed in the tide pool at high tide and remain in the tide pool at low tide**, creating a diverse ecological effect in the tide pool when there is still seawater at low tide.

Ecological survey

Community and Industry Symposium

- From 2021 to 2023, the TIPC has held 12 excavation management symposiums to increase communication between the public and industry on the Taipei Port Reclamation Project.

Future prospects

Accelerate the progress of port reclamation

- The collection capacity of Basic Oxygen Furnace (BOF) slag has been increased from 482,000 cubic meters per year to 815,000 cubic meters per year.

- The Construction Surplus Soil has been increased from 3 million cubic meters per year to 4.2 million cubic meters per year.

Construction Surplus Soil + Basic Oxygen Furnace (BOF) slag
> 5 million cubic meters / year

- Evaluation of the application of Incinerating recycled aggregate (IRA) (under test)

Taipei Port is the only port in Taiwan that accepts Construction Surplus Soil and Basic Oxygen Furnace (BOF) slag, achieving the goal of reusing appropriate resources and materials in the right place and achieving a win-win situation for both project quality and environmental quality.

Reclamation, smart efficiency, green ecology

Taipei Port

A New-Generation Port