Muelle Prat Container Terminal in Barcelona

Client: HNH / TERCAT

Basic Design and part of Detailed Design

- Berth length: 1.500 m
- Area: 93 ha
- Container vessel design: Emma Maersk.

- ASC Container yard.
- Intermodal yard.
- Berthing and mooring elements and utilities.
Container Terminal in Malaga Port

Client: Terminales del Sudeste S.A.

Market study and final design.

- Surface 400,000 m², 822 m for berthing and capacity for 750,000 containers.
- Facilities for gantry cranes and others.
- Administration building, gates and workshop.
San Andres Breakwater of Malaga Port

Spanish National Innovation Award (Ministry of Public Works)

Cliente: SATO

Basic design and modelling of the new breakwater and land reclamation

- Expansion of breakwater San Andrés basin with Cubipods
- New area for fishers facilities.
- New fishing quay 105 m long
Pier #2 and #4 of Rota Naval Base

Client: Ministry of Defense. Spanish Navy

Detailed design

- 1,800 m concrete caisson quay and pontoon.
- 1,500,000 m³ dredging
- Buildings and pavements.
- Power, water, fuel, and communication networks.

- Ro-Ro ramp.
- Investment: 88,300,000 €
Breakwater Extension in Port of Mutriku, Guipuzcoa.

Client: SATO

Tender design. Physical modeling in wave flume

- 88 m long breakwater extension
- Armor with 40 t and 102 t Cubipods
- Concrete crest wall at +16.25 m
Extension of the New Commercial Wharf in Marín, Pontevedra

Client: Port Authority of Marin and Pontevedra (Spain)

Detail Design

- Multipurpose terminal
- 148 m extension of piloted wharf, 11 m draft
- 10,000 m² of reclaimed land
- 30,000 m³ of dredging to be used as filled material
- Investment: 10 M €
Access Channel and Inner Basin, Rota Naval Base in Cadiz

**Client:** NAVFAC EUROPE & SOUTHWEST ASIA

Detailed design and environmental impact assessment

- Access Channel: 3500 x 245 m.
- Inner basin: 300,000 sq m.
- Dredging depth: 15 m.
- 3.9 M m³ of dredge material.
- Construction budget: EUR 40 M.
- Physical modeling in the Pablo Bueno Chair Maritime Engineering Laboratory. Polytechnic University of Madrid
Reina Sofia Breakwater in Las Palmas Port

Client: Las Palmas Port Authority

Modified detailed design.

- Breakwater length:
  - Reina Sofía: 490 m.
  - Esfinge: 580 m

- Caissons:
  - 29 m high
  - 44.3 m long
  - 24 m wide
Remodelation Study of the Container Terminal in Bilbao

Client: ABRA Terminales Marítimas S.A.

Technical Studies

- Operating units definition.
- Analysis of possible imbalances according to the forecast traffic.
- Occupancy Calculation.
- Calculation of terrestrial connections capacity.
- Resizing of facilities.
- Efficiency calculation.
New berths for atlantic Copper in Huelva

Client: Atlantic Copper

Feasibility study, Detailed design and Construction supervision

- 145 m long walkway
- Loading platform
- Dolphins, bollards and fenders
Rehabilitation of the Ercros-Atlantic Copper Terminal

Client: Atlantic Copper

Detailed design and Construction Supervision.

- Preparation map of pathologies (broken prestressed reinforcement, oxidation, etc.).
- Design of rehabilitation works.
- Preparation of tender (invitation documents, evaluation of bids and award proposal to the client).
- Supervision of works.
Bulk terminal in Sagunto Port, Valencia

Client: EUROPRAXIS-ATLANTE, S.L.U.

Preliminary design and alternative study for the transfer of a bulk terminal

- 560 m quay, facilities for cranes, roads, access, train, pavements, supplies, fire fighting, sewage, etc.
- Buildings for offices and bulk material.
La Curra New Marina, Cartagena in Murcia

Client: INTERSA

Detail design and environmental study.

- 60,000 m² of water surface
- Capacity for 691 ships, with lengths up to 40 m.
- Marina seca
- 413 m vertical breakwater

- Buildings: Social club, offices, shops, restaurants, etc.
- Utilities: Power, water supply, waste, fuel station, etc.
- Investment: 59,837,000 €
Marina of Ibiza

Client: Serveis Maritims del Port de Eivissa S.L.

Basic design.

- 33,000 m² of water surface
- Capacity for 380 ships, with lengths up to 50 m.
- New breakwater at the port mouth

- Buildings: Social club, shops, restaurants, etc.
- Utilities: Power, water supply, waste, fuel station, etc.
- Investment: 31,800,000 €
Marina of Alcudia

Client: Ocean Infrastructures Management S.L. (OIM)

Preliminary design

- New marina 30,000 m² of water surface
- 12,000 m² land for 200 vessels with lengths of between 10 and 30 m.
- Floating and fixed docks.
- Building, Facilities and Fuel station.
Marina in Soller, Mallorca.

Client: Regional Government of the Balearic Islands Ministry of the Environment.

Detailed design

- Breakwater
- Berths
- Port-city integration
- Urbanization
- Administrative buildings, boatyard, utilities, etc.
Marina in Curuxeiras, Ferrol

Client: Ferrol Port Authority

Detailed Design

- Design of berths
- Dredging accesses
- Buildings
- Utilities
- Port-City integration.
Wharf Extension for Cruisers in Palma de Mallorca

Client: Balearic Port Authority

Detailed Design

- Extension of the existing wharf.
- 18 reinforced concrete caissons with separation between them to allow the water circulation through the wharf.
- Caissons are connected with reinforced concrete slabs.
Port Planning for Figuera Bay – Mahon Port, Menorca

Client: Balearic Port Authority

Basic design

- Location study.
- Cruiser wharf configuration.
- Maritime passenger terminal.
- Port planning for leisure boats.
Boatyard in Palma de Mallorca

Client: PIER 46 S.A.

Bidding design

- Boatyard space organization
- Maintenance workshop
- Administrative building

- Berths
- Travel-lift
- Washing facilities, oil separators, etc.
Sheet Pile Wall for Oil Pipeline Rescue in Huelva Port

Client: MASA

Detailed design

- Sheet pile wall for rescuing of CEPSA’s pipeline stacked on depth of -20 m during its guided placement.
- 26.5 m long sheet piles, braced at four levels.
- Soil treatment, road diversion and work platforms.
Desalination Plant of Moncofa, Castellon

Client: UTE IDAM-MONCOFA

Detailed design of the pipeline and intake, stability tests in 3D physical model

- Shortening of the pipeline in 1.100 m
- Change of location
- The design of the intake.
- Stability test in 3D physical model at the 1:20 scale.
Ecological studies and mapping of the north arc of Gran Canaria island

Client: General Directorate of Coastal Areas

Ecological studies and mapping.

- Making a support detailed mapping of the coastline of the north of the island of Gran Canaria.
- A description from the point of view of its heritage and natural marine communities.
Master Plan of Coasts. Castellon, Valencia and Alicante region

Client: General Directorate of Coastal Areas

Master Plan for sustainability of the coast.

- Characterization and analysis of the coastal environment, economical and urban priorities.
- Development of proposed action and alternatives.
Gijon Port expansion

Client: Gijon Port Authority

Construction supervision and technical assistance.

- Torres breakwater: 941 m; North breakwater: 1,251 m.
- 3,834 m breakwater.
- 145 ha surface.

- 1250 m quay.
- 44.8 M m³ fill material.
- EUR 700 M investment
New Harbour in Punta Langosteira, A Coruña

Client: Supervisión UTE LANGOSTEIRA (Dragados, Sato, Copasa & Drace)

Construction supervision and technical assistance.

- 3,330 m breakwater. 921 m quay.
- Back up land: 143 ha
- EUR 506.3 M investment budget.

Projects around the world
In Spain
Emergency Works for Coastal Protection of Aboño, Asturias

Client: TECNIA Ingenieros S.A.

Construction supervision and technical assistance.

- 670 m of coastal protection
- 160 m of river bank protection
- 3400 m³ of rock of 500-800 kg
- 2389 concrete cubes of 10 t
- 795 concrete cubes of 45 t
- 556 concrete cubes of 90 t
Pier #1, #2, #4 and Auxiliary Vessels Wharf of Rota Naval Base

Client: Ministry of Defense. Spanish Navy

Construction supervision and technical assistance.

- Demolition of existing structures
- Dredging of more than 1.5 Mill. m³
- Three concrete caisson piers with total length of 1,800 m
- Construction of an auxiliary vessels wharf

- Ro-Ro ramp
- Buildings and pavements
- Power, water, fuel, and communication networks
- Total investment: 88,300,000 €
New Wharf and Reclamation Area in Palma Port, Palma de Mallorca

*Client: Balearic Port Authority*

Construction supervision and technical assistance.

- 330 m of concrete caisson’s wharf
- 40 ha reclamation area
- 750 of coastal protection with 6t concrete cubes and 3t riprap
- Pavements and utilities
- Investment: 50 M€
Lazaro Cardenas Container Terminal, Mexico

Client: ICA

- Detailed design and technical assistance.
  - 42 ha.
  - 750 m. quay; 16 m draft.
  - Automated stocking area, soil treatment, buildings, CFS, roads and pavements, intermodal yard, facilities.
New Container Terminal in Manzanillo Port, Mexico

Client: ICA

Bidding Design and alternative study for the quay and soil treatment.

- 30 ha for container terminal, 720 m.
- Long quay, stocking area, buildings, CFS, roads, train terminal, facilities, etc.
- Capacity for phase 1: 400,000 TEU per year.
- Investment: 190 Million USD
Expansion of Solid Bulk Terminal in Puerto Cortes, Honduras

Client: Honduras’s Seaports (PMH)

Preliminary and final design and work supervision.

- Pier 3: 417 m long, 14 m deep.
- Works to improve the Bulk Terminal capacity and operational efficiency:
  - Pier modernization: demolition and replacement of the damaged structure.
  - Expansion of Pier 3: Extension with a 215 m long and 22.20 m wide pile supported structure
Panama Canal

Client: CH2M Hill

Project Management support to the Panama Canal's Authority (ACP).

- Consultant: CH2M Hill in association with TYPSA and DHV.
- Two new canal-lock complexes (Pospanamax 1.400” x 180”).
- 76 M m3 dry excavation.
- 23 M m3 dredging
- USD 5,250 M.
Panama Copper Mine. Petaquilla, Panama

Client: FCC CONSTRUCCIÓN S.A.

Alternatives study and bidding design

- New port for minerals and cargo and 40 km of road
- Auxiliary wharf
- 51 Mm3 of excavation
Astialba Shipyards, Venezuela

Client: Andrade Gutiérrez

Preliminary and Detailed design of Shipyards for the construction of VLCC and Suezmax oil tankers.

- Breakwaters, quays, piers and dry docks.
- Design of the landfill and soil treatment
- Maneuvering Area: depth of 11.40 m.

Filling: 17,445,239 m³
Dredging: 16,769,593 m³
Basin: 600m x 770m
New Container Terminal in Paita Port, Peru

Client: OSITRAN

Construction supervision and technical assistance

- Quay 300 m long.
- Container Yard 12 Ha of reclamation area.
- Coastal protection 1050 m long with 100 – 300 kg rock
- Dredging to -13 m with a quantity of 1.4 million m³.
- Buildings, cranes and equipment
Feasability Study for Mineral Port in Pacasmayo, Peru

Client: MACROCONSULT

Feasability Study

- Technical study and economic analysis
- Numerical models for hydrodynamic and morphodynamic studies and study of sediment transport
- Environmental study
Feasability Study for Conga Mineral Terminal, Peru.

*Client: MACROCONSULT*

Feasibility study

- Location alternatives study
- Basic technical study
- Investment analysis, economic analysis, maintenance and operating costs
New Access Channel in Port of Callao, Peru

Client: ENAPU

Alternative study, maneuvering modeling and detailed design. Traffic analysis, geotechnical and topographic study, design of the new access channel, breakwaters and dredging area.

- Channel length: 2,200 m.
- Draft: -16.00 m.
- Vessel Design: Container 347 m length.
- Dredging Volume: 4 M m³.
- Modification of 475 m breakwater.
Ore Terminal in Callao Port, Peru

Client: OSITRAN

Construction supervision and technical assistance.

- Dock for bulk carriers of 226 m in length.
- Pier 200 m long and 14 m deep with shiploader.
- Watertight tubular conveyor on structural supports 3,000 m in length.
New Mineral Terminal in Matarani, Peru

Client: TYSUR

Construction supervision and technical assistance

- 200 m long pile-supported pier with 20 m draft, equipped with a rail-mounted shiploader
- 170 m long access bridge built on pile foundations
- 480 m long railway trackbed for 8 tracks
Port Terminal in river Huallaga, Peru

*Client: Tegepsa (TYPSA Group)*

Feasibility study.

- 5 berths
- Fenders, bollards, facilities for cranes, buildings for offices, workshops, warehouses, roads (road access and internal roads), paving, electricity, water, fuel, communications network and fire fighting.
New harbour in Açu, Brazil

Client: DRAGADOS AND CONSTRUCTIONS, S.A.

Bidding design. Breakwater and quays for ore and oil

- 2,100 m quay
- Dredging to -24 m and -26 m
- Ships Size: Chinamax, Suezmax and VLCC
- Precast reinforced concrete caissons up to 51 m in length
Wharf for Cruisers in Rio De Janeiro, Brazil

*Client: ODEBREC HT*

**Project Supervision**

- 2000 m of wharf with vertical and battered piles. Geotechnical, structural and operational studies, fenders and bollards, etc.
- Design vessel: Queen Mary 2 (length: 345m long, draft: 10m)
Expansion of a Container Terminal, Brazil

*Client: Terminal Santa Catarina (TESC)*

Detailed design, study of the geotechnical stability of the quay and design of piles and sheet piled berth.

- Quay expansion in 160 m
- Dredging to a depth of -13.00 m
- Sheet piling to the depth of -22.50 m
Del Plata GNL Terminal in Punta Sayago. Montevideo, Uruguay

Client: Gas Sayago

Site supervision and technical assistance.

- Offshore breakwater, 1550 m long, with 3.0 m³ accropodes.
- Substitution of 3.2 Mm³ of soil by dredging
- Main Jetty for GNL, 465 m long, with main platform and 16 dolphins
Expansion of the solid bulk terminal at Nueva Palmira, Uruguay

Client: Corporación NAVIOS S.A.

Supervision and construction engineering services (civil works and electromechanical equipment).

- Two pile-supported piers. Main pier: 305 m. Barge pier: 140 m
- Shiploader on rails on main pier, with a design capacity of 3,900 t/h (ore) and 2,400 t/h (grain)
- Seven main conveyor belts and two connecting to existing infrastructure
- Two ore storage piles (up to 600,000 mt)
- Stacker reclaimer on rails along a length of 330 m
Large-Scale Port in San Antonio, Chile

Client: EPSA

Basic design. Field works supervision

- Two container terminals for 6 M TEU/year
- 3.5 km of wharf
- 180 Ha of back area
- 11 Mm3 of dredging

- 3.5 km of roads
- 2.3 km of railways
- Investment: 2,800 M USD
Container Terminal in Valparaiso Port, Chile

*Client: FCC CONSTRUCCIÓN S.A.*

Alternatives study and preliminary design

- Modernization of 5 berths
- Sheet piles and anchorages for wharf strengthening
- Demolition of old structures and new 120 m piled wharf

- Design ship: Emma Maersk (397 m long, 16 m draft)
- Deck design for 100 t capacity crane
CONTAINER TERMINAL IN MANTA. ECUADOR

Client: AGUNSA
Basic Design for Private Initiative

- Expansion of current quay, depth -14.5 m
- Container yard 6Ha, capacity 120,000 TEU/año, buildings, facilities (power, water supply, sewage, communications, CCTV) and pavements.
New Facilities at Al Jubail Naval Base – Saudi Arabia

*Client: Navantia*

Basic design of the new maritime and land infrastructures.

- 345 m length pier.
- Dredging: 888.495 m³
- Buildings: Maintenance, Technical School, Warehouse Center, Arsenal.
- CAPEX: Confidential
New Facilities at Jeddah Naval Base, Saudi Arabia

Client: Navantia

Basic design of the new maritime and land infrastructures.

- 2 concrete piers # 150 m length x 25 m wide each.
- Electrical Substation
- Improvement of Fuel supply facilities
- Buildings: Maintenance, Technical School, Warehouse Center, Arsenal.
- CAPEX: Confidential
Meteorological Mast for the Offshore Wind Farm of Moray Firth, Scotland

Client: DRACE Infraestructures

Detailed design and 3D physical model

- Cellular concrete caisson with 33 m x 33 m at the base and 16 m high, at the depth of 40 m.
- Monopile 40 m high and metallic lattice structure 80 m high.
Land Reclamation Area, Principality of Monaco

Client: JV Montecarlo Sea Land

Bidding design of the infrastructure of conventional and Jarlan type concrete caissons.

- Construction of an artificial island in front of the Principality of Monaco of 27 hectares. For the development of new housing, marina, commercial areas, etc.
- Budget investment: EUR 5.000 M.
Rehabilitation of Coastal Area of Bagnoli, Naples Community

Client: CONS.COOP.

Executive basic design and technical documents for bidding

- Dredging of dangerous material down to bahymetric line of -30 m and dredging of contaminated non-dangerous material down to the level -7 m; 2.200 m of coast.
- 2400 m of submerged breakwaters
- 1.000 m of waterproof sheet pile wall.
New Multipurpose Terminal in Nouadhibou Fishing Port, Mauritania

Client: Port Autonome de Nouadhibou

Feasibility study for the new terminal and work supervision

- EUR 20,708,406 investment.
- Financed by the Spanish Government.
- New terminal with 4 berths.
- Dredging of the channel and basin.
- Facilities for Ro-Ro ramps, pavements, roads, fenders and bollards.
New Coastal and Artisanal Fishing Port, Mauritania

Cliente: Ministry of Fishing and Economy of Mauritania

Preliminary design, EIA and final design.

- Capacity for 30 artisanal fishing boats, five coastal fishing vessels, 200 small boats and 2 surveillance vessels.
- Two breakwaters (615 and 510 m long) armored with 32 t cubipods.
- Buildings (Fish market, ship-owners booths, ice factory, hotel, administration building, mosque, etc.).
Ports for the cabotage system, São Tomé and Príncipe

Client: EU Delegation in Gabon

Preliminary studies, field works, basic and detailed design for the reconstruction of five ports and construction of one completely new port.

- Six wharfs in different locations
- 125 m of breakwater with 1-3 t rock
- 400 m of coastal protection with 100-200 kg rip-rap
- Roads, buildings, utilities, etc.
Identification and Rehabilitation of Leisure Ports in Madagascar

Client: World Bank

Feasibility study
- Study of existing port infrastructures.
- Feasibility study for new leisure ports.
- New management models, incorporating a private sector.
New Container Terminal in Mumbai Port, India

Client: Indira Container Terminal (ICT) Pvt Ltd

Technical Assistance for the project management and revision for the design of a container terminal

- Container terminal with 700 m. berth
- Access bridge of 1500 m
- Capacity: 2 million TEU per year
New Transhipment Port In Colachel, India

Client: VOC Chidambaranar Port Trust

Techno-Economic Feasibility Study

- Container Terminals for 8 M TEU/year
- 5.4 km wharf (4 km for containers), 20 m draft
- 380 ha of reclaimed land
- 15 Mm3 of dredging
- Connectivity: 11 km of road and 10 km of railway
- Investment: 2,900 M USD
Due Diligence Semeikhon Port General Cargo Facility Project, Myanmar

Client: Mandalay Myotha Industrial Development

Due diligence, design review and technical audit of the Semeikhon Port General Cargo Facility Project.

- Elements: Pontoon (Length: 53m), Crane (50t capacity), Ramp, Access bridge (Length: 21m) and 9 Mooring points.
- Works to assess the critical technical and economic factors affecting the port construction or which may impair the ability of the general cargo facility to operate as anticipated.
TYPSA and the Technical University of Madrid (UPM) have signed an agreement through the Agustín de Betancourt Foundation, for the promotion of knowledge and research in the installations of Madrid Civil Engineering School, as well as scientific-technical guidance related to the field of Maritime Engineering and Marine Energies within the framework of the agreement “MARITIME ENGINEERING RESEARCH UNIT TYPSA - INGENIERO PABLO BUENO"
Maritime Research Laboratory

Investigation in structural and hydraulic stability of breakwaters:
• Behavior on total, partial stability and unstability condition of protection layers
• Evolution of damage and damage curves
• Influence of waves incidence direction
• Hydraulic behavior in run-up and overflow condition
• Stability in design phases of Auxiliary elements, berms,…

At the research level:
• Study of new structural typologies in outer harbours
• New materials
• Dynamics and coastal processes in offshore windmills
• Coastal urbanism
• Scour and erosion of foundations
• Submarine pipelines. Protections

Other:
• Knowledge of the “state of the art” and its communication.
• Scientific and technical support