



opus
ASSOCIATE ENGINEERS

Excellence at your Hands



We offer SERVICES in:

MULTIDISCIPLINARY ENGINEERING AND ARCHITECTURE

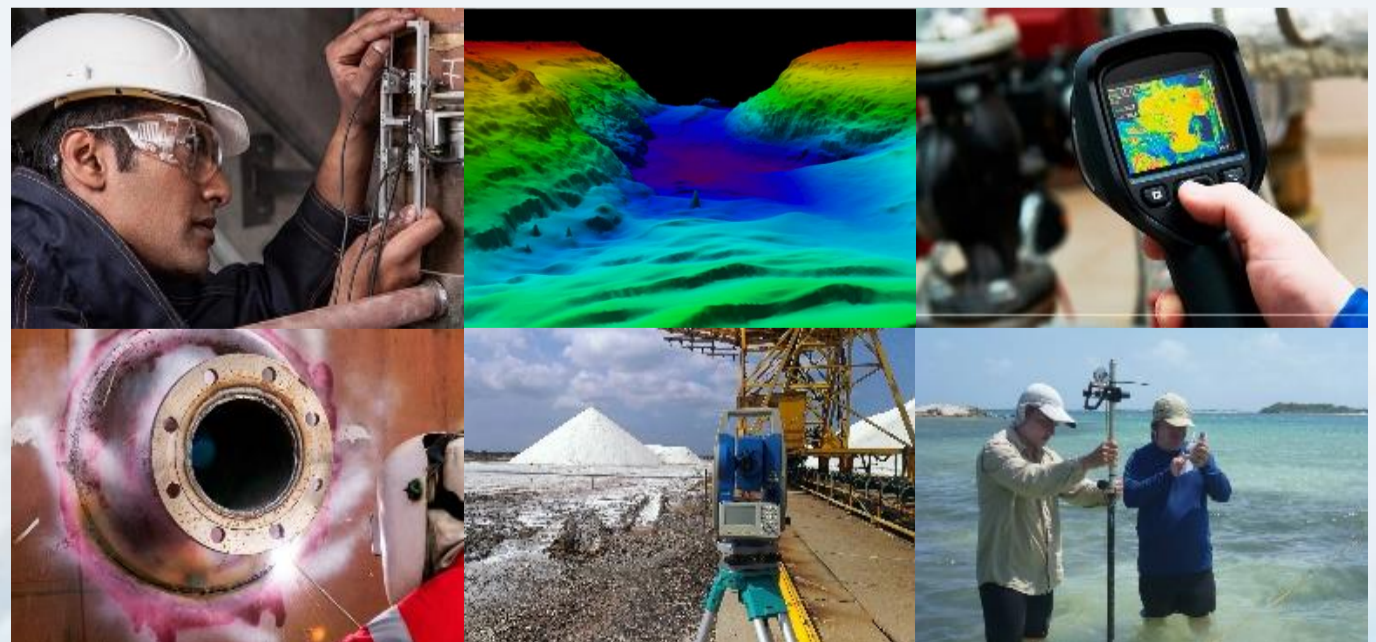
- Mechanical engineering
- Hydraulic and hydro-sanitary engineering
- Architecture and urbanism
- Electrical engineering
- Agro-industrial plants
- Mechatronic robotics and automatization of processes
- Structural engineering
- Road design and earthwork
- Food science engineering
- Industrial maintenance engineering

PROJECT MANAGEMENT, VARIOUS SERVICES

- Management and planification of projects
- Quality Management System (QMS)
- Inspection of Projects/ Equipment/ Systems
- Survey of Facilities (CAD-Revit)
- Topography, Geodesy, and Photogrammetry
- Industrial maintenance management software development.
- Supply and installation of drainage systems.
- industrial floors with high chemical/physical resistance.

SPECIALIZED STUDIES

- Electrical area
- Hydraulic area
- Food science engineering
- Destructive and non-destructive testing.
- Bathymetric and topographic studies



What motivates us as a team?

We are **passionately motivated** by a profound desire to generate a positive impact and **accompany our clients in executing their organizational growth plans**, tending to their needs and **giving them the support that guarantees the success of the projects entrusted to us.**

Who makes it possible?

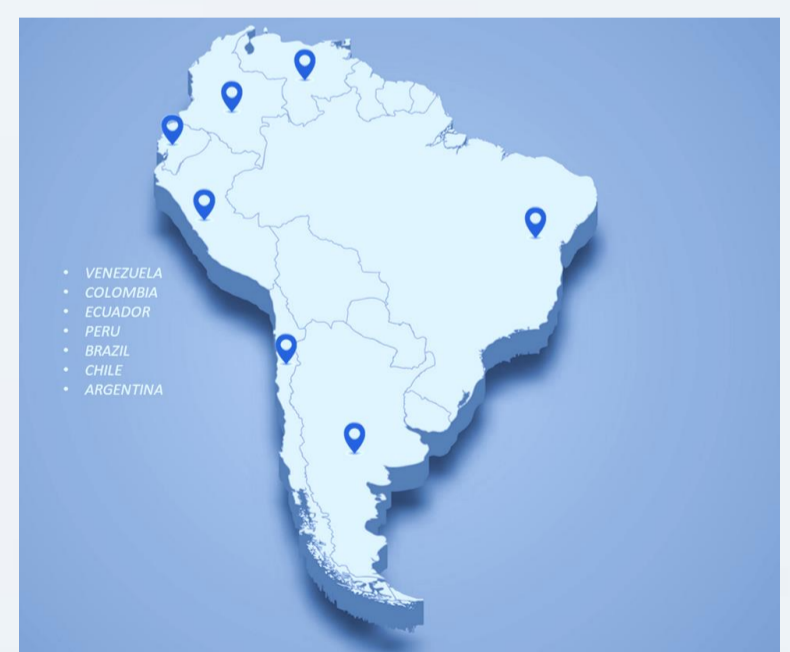


We count on a **staff of more than 50 professional experts** in multiple areas **who have an average of more than 20 years of prolific and successful careers**; compromised with adding value and positively impacting the processes of our clients via the providing of excellent services.

What do we offer?



OPUS, Associate Engineers, offers **multidisciplinary engineering services**, be it in a **remote or/and on-site manner**, counting with professionals in more than eight (8) countries and supported by the connection that the Internet provides; we are always disposed to service you in a personalized way to **guarantee a close and excellent experience.**



OPUS, Associate Engineers, ¡Excellence at your hands!



**Successful Experiences in:
Hydraulic construction, Fluvial,
Maritime, and Harbor Engineering**

EXPERIENCES IN HYDRAULIC CONSTRUCTION, FLUVIAL, MARITIME, AND HARBOR ENGINEERING

The professional core that forms OPUS Associate Engineers today presents a wide experience in multiple projects for distinguished Venezuelan companies in the Hydraulic construction, Fluvial, Maritime, and Harbor industries.

We guarantee a service of a high technical level via an expert team of multidisciplinary professionals who are knowledgeable of the processes associated with that sector.

We will proceed to summarize some of the Hydraulic Engineering services we offer, and some of the projects developed by the professionals at OPUS associate engineers in the framework of their respective career experiences in hydraulic, fluvial, maritime, and harbor construction projects.

Hydraulic engineering services we offer:

- In-site measurements.
- River engineering.
- Coast and harbor engineering.
- Navigation channel design. Navigation aids System.
- Drainage, Sewers, Aqueducts, and Water Supplies.
- Dredging.
- Execution and Inspection of Hydraulic Projects.

In-Site Measurements

- Topography.
- Bathymetry.
- Winds.
- Waves.
- Tides and levels in rivers, estuaries, and coast areas.
- Flow studies (ADCP) and both conventional and ADCP gauging.
- Geophysical studies: seabed profiler, side scan sonar, and magnetometry.
- Lab sampling and analysis of bed and suspended sediments.
- Environmental parameters analysis.
- Information surveying of underground water catchment constructions.

River (Fluvial) Engineering

- Hydrological and climatological studies, hydric balance determination, integral studies for the management of watersheds.
- Design of rivers' streams and margins protection and stabilization projects.
- Bypass projects.
- Flooding evaluation and control.
- Bridge and road protection.
- Application of mathematic, hydrodynamic, and sedimentological models.
- Geomorphology and Fluvial Morphology.
- Identification and demarcation of potential promissory water use areas.

Coast (Maritime) and Harbor Engineering

- Protection and stabilization construction design.
- Coastal morphodynamics.
- Seawall, breakwater, and pier design.
- Sport harbor and seascape design.
- Mathematical coast morphology modeling.
- Design of navigation channels and access to harbors, staging areas, and docking zones.
- Navigation aid system design.
- Beach stabilization and recovery projects.
- Integral operation of coastal areas.
- Dispersion studies.
- Submarine emissaries and water intake design.

Projects in Drainage, Sewers, Aqueducts, and Water Supplies

- Study and design of road draining, sewers, aqueducts, and superficial draining for urban planning.
- Evaluation projects of water source usage for multi-purpose supply: Human consumption, industrial farming, commercial, and bottled water.
- Wastewater web, collector, and treatment plant design.
- Desalinization plants.

Dredging

- Oceanographic, bathymetric, sedimentological, and geophysical studies.
- Dredging project development:
 - Dredging geometry assessment (Access channel, maneuvering area, docking zones, fluvial and maritime navigation channel)
 - Dredging volume quantification.
 - Dredging methodology defining.
 - Determination of the dredging material's final disposition.
 - Dredging machinery defining.
- Quantity and cost quantification.
- Dredging plan elaboration.
- Maintenance dredging evaluation.
- Environmental impact study.

Execution and Inspection of Hydraulic Projects

- Coastal stabilization and protection projects such as seawalls, breakwaters, and piers.
- Beach recovery projects (Coast restitution via dredging)
- Dredging project execution.
- Building of docks and shelter structures for harbors and seascapes.
- Navigation aid system installation.
- River projects for the stabilization of margins and beds.
- Protection projects for bridges and communities adjacent to the rivers.
- River branching projects.
- Flooding prevention and control structures' construction.
- Construction of supply webs, collectors, and treatment plants for wastewater.
- Management, Administration, and Inspection of hydraulic, coastal, harbor, and fluvial projects.
- Management, Administration, and Inspection of dredging projects.
- Environmental supervision plans implementation.

HYDRAULIC-FLUVIAL ENGINEERING HYDRAULIC STUDY OF LOS PADROTES, SAN FERNANDO, APURE RIVER

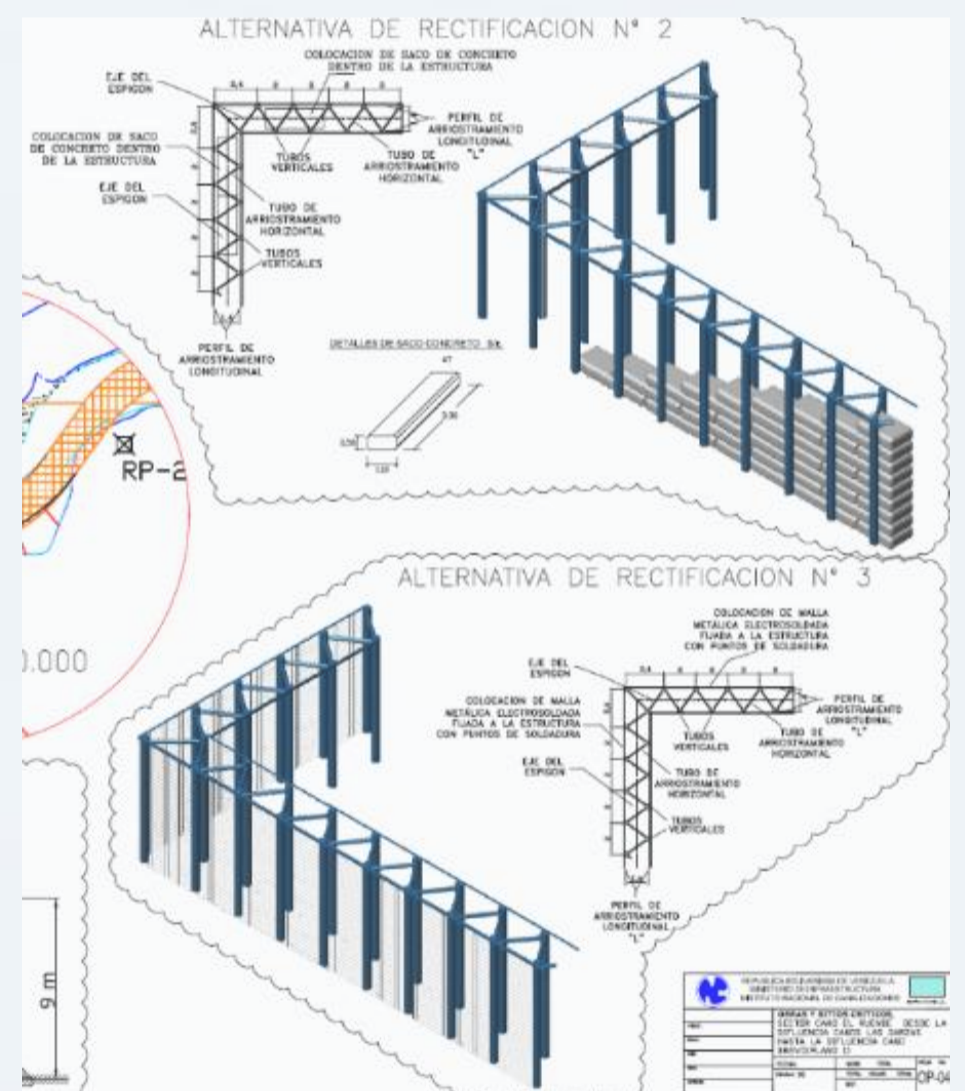
DESCRIPTION

Hydraulic evaluation of the Los Padrotes sector with the goal of projecting the margin stabilization and navigation channel consolidation projects, in harmony with the environment and to protect the area against floods.

Location: Apure state, Venezuela. 2007.

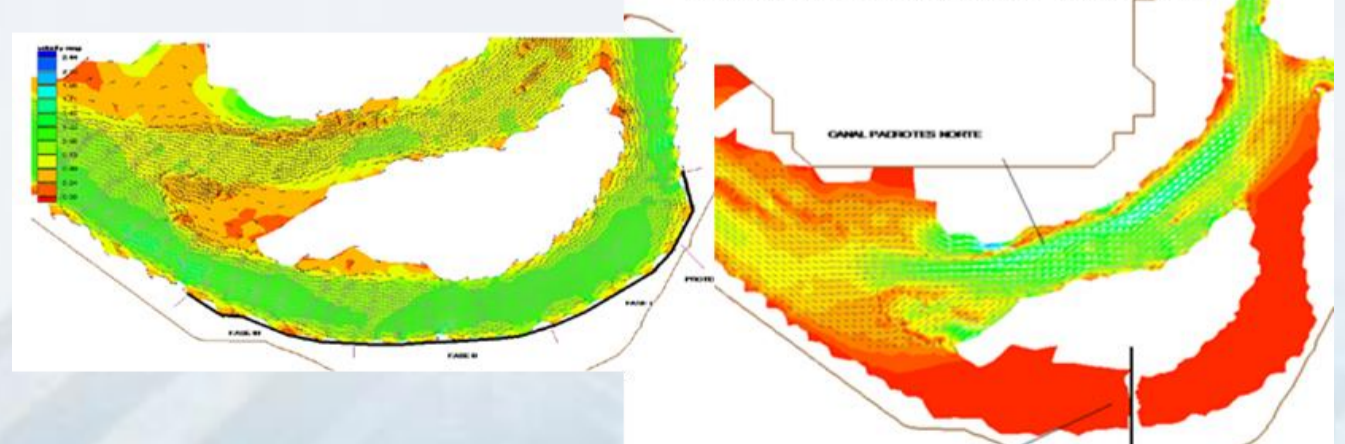
SCOPE

- Basic information surveying.
- Hydrological, geomorphological, geological, sedimentological, and hydraulic analysis.
- Sediment transport unidimensional and bidimensional hydrodynamic model development
- Project alternatives simulation. Detailed engineering of the suggested project.
- Cost-benefit solutions evaluation. Environmental evaluation.



Modelo Bidimensional sin obras

Modelo Bidimensional con obras



Project's Technical Leader:
Mr. Roberto Savelli.

HYDRAULIC-FLUVIAL ENGINEERING EVALUATION OF THE STRETCH BETWEEN CHAPARRERO AND EL SAMÁN DE APURE, IN THE APURE RIVER

DESCRIPTION

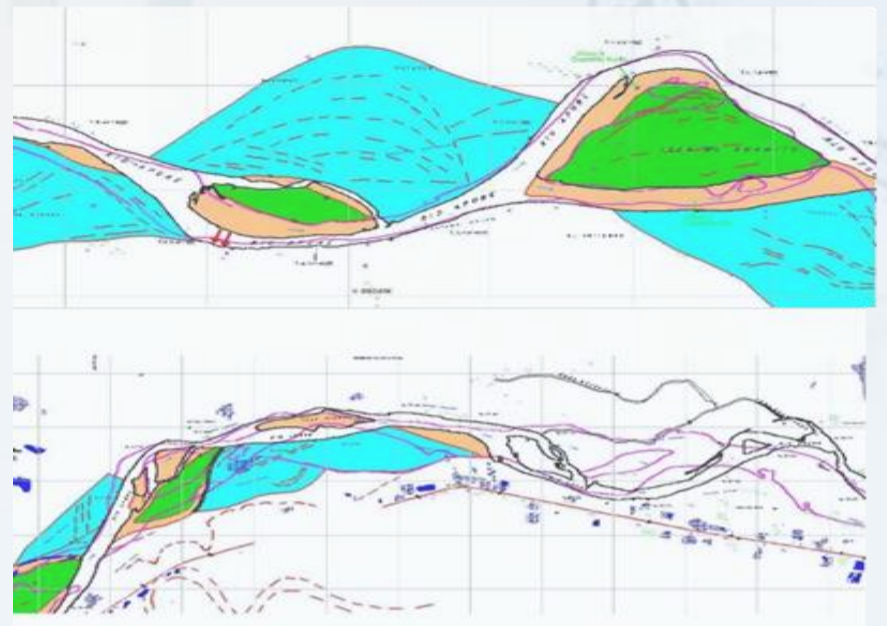
Hydraulic evaluation of the stretch between El Chaparrero and El Samán de Apure, identifying critical points for navigation and determining projects to establish navigation via the stabilization of the channel and the river's margins in critical areas.

Location: Apure state, Venezuela. 2009.

SCOPE

- On-site measurement planning and execution, current situation diagnosis. Hydrological, hydraulic, geomorphological, and sedimentological studies of the area.
- Development of the unidimensional and bidimensional hydrodynamic and sediment transport model.
- Project alternatives simulation.
- Basic engineering of the presented project.
- Cost-benefit evaluation of the solutions.
- Environmental Evaluation.

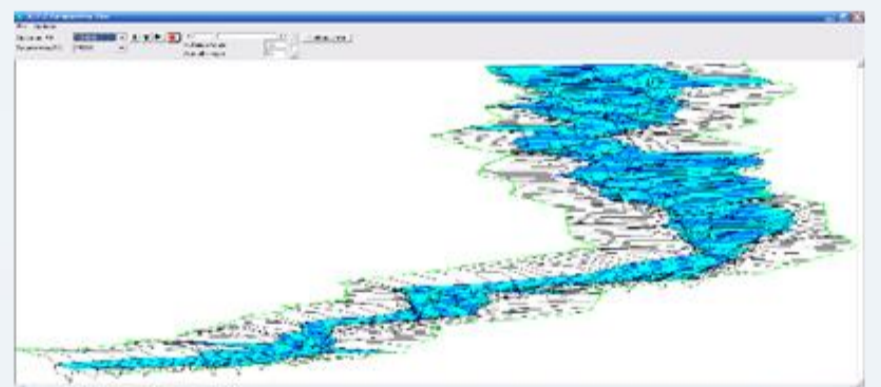
Resultado del análisis hidráulico y fluviogeomorfológico



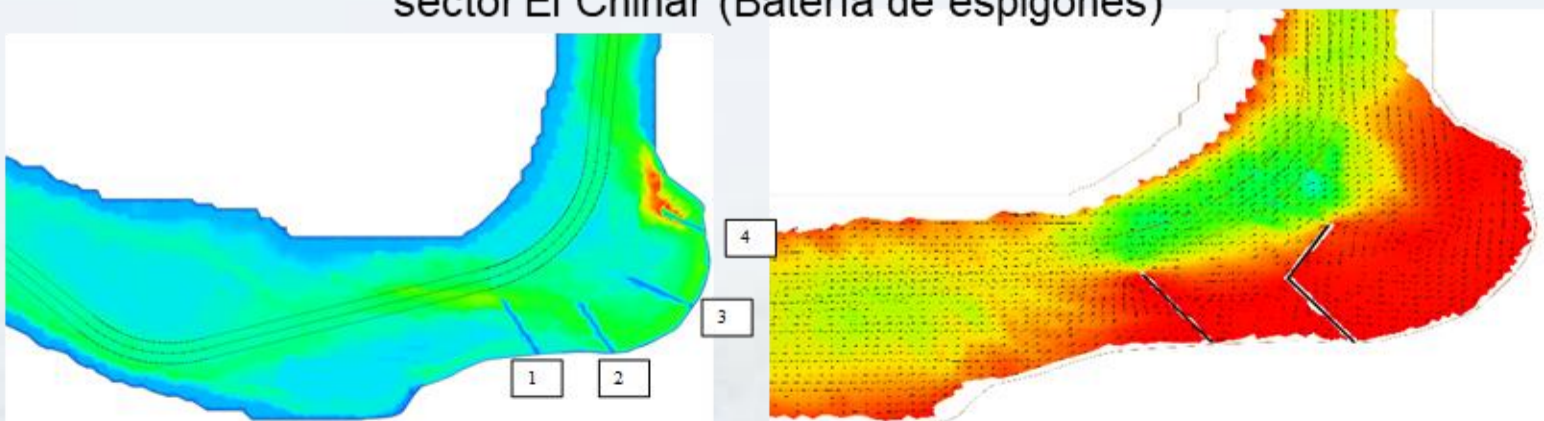
Análisis Hidráulico – Evolución de la sección transversal del río. Prog. 389+500. Período 2001 - 2008



Distribución de los perfiles transversales en el tramo Bruzual – Chaparrero, período de aguas altas



Modelo Bidimensional con obras, estabilización canal y margen derecha del sector El Chinar (Batería de espigones)



Project's Technical Leader:

Mr. Roberto Savelli.

HYDRAULIC-FLUVIAL ENGINEERING NAVIGATION DEVELOPMENT IN THE ORINOCO- APURE AXIS

DESCRIPTION

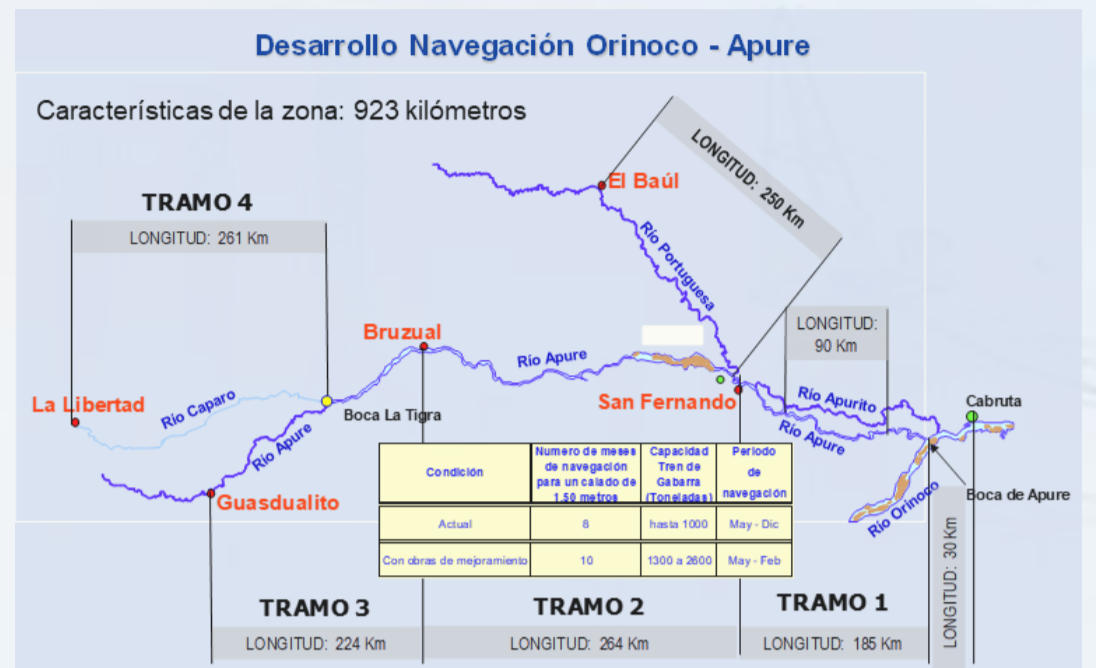
Framing of an axis in the immediate influence area of the Orinoco and Apure rivers, as well as their branches, with the production of a set of productive and social activities capable of ensuring an important territorial occupation and its integration with the socio-economical transformation process.

Location: Apure state, Venezuela. 2008-2011.

SCOPE

- Coordination. Technical, economical, and administrative Supervision of the Project.
- Planning and execution of navigation improvement studies, projects, and constructions (Demand, hydraulic projects, environmental considerations, dredging, future administration of the navigation channel).
- Actions for the opening of the navigation channel (Fleet definition, navigation channel design, navigation aids design).

Project's Technical Leader:
Mr. Roberto Savelli.



Tipo Gabarra	Manga (Metros)	Eslora (Metros)
Apure	13	60 Sin Remolcador
Portuguesa	10,6	40 Sin Remolcador

HYDRAULIC-FLUVIAL ENGINEERING HYDRAULIC ADJUSTMENT PROJECTS FOR THE MARÍA NIEVES BRIDGE. RÍO APURE.

DESCRIPTION

Hydraulic evaluation to verify the influence of the hoisting system that is required to allow the passage of ships, including navigation aspects, local scouring, river margins impact, and relocation of the drinkable water system.

Location: Apure state, Venezuela.

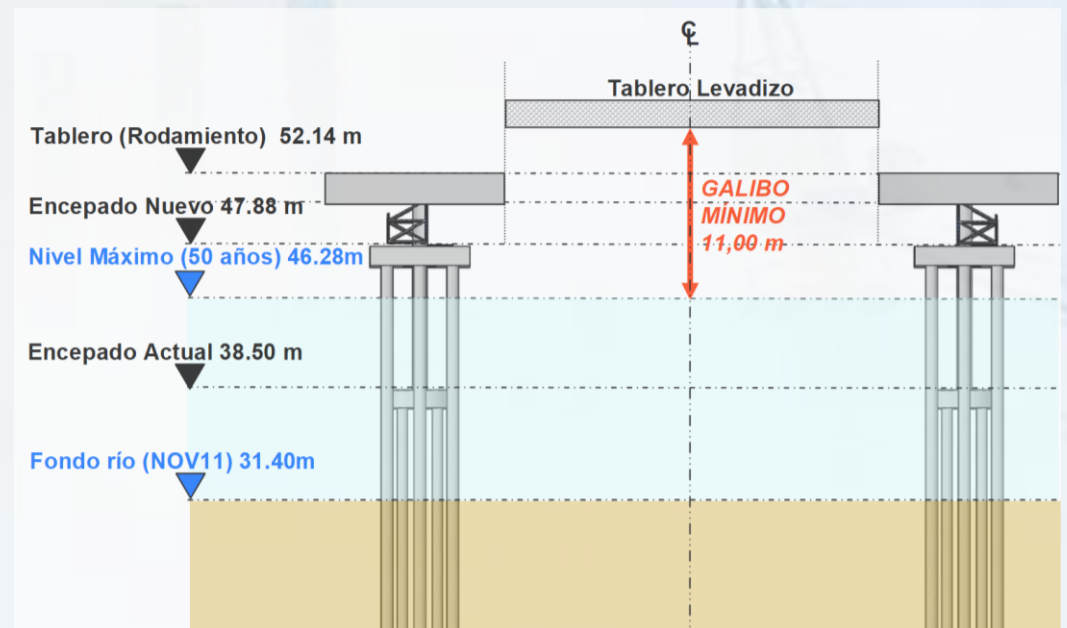
2008-2011.

SCOPE

- Field measurements (bathymetry, topography, currents, and sediments. Geomorphological study, stream and river margins stabilization.
- Diagnostic and design.
- Dimensioning of the drawbridge, protection projects against coalitions, and drinkable water transport piping.
- 3D mathematical model application to verify the influence of a drawbridge in the morphology and hydrodynamics of the river.

Project's Technical Leader:

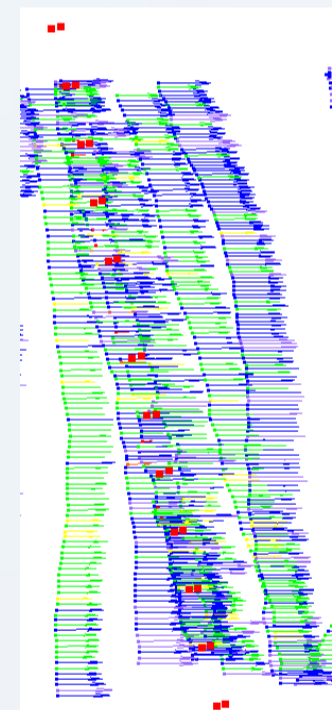
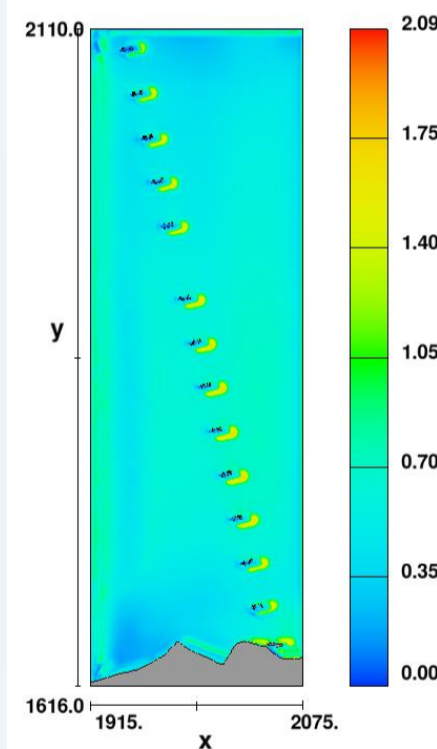
Mr. Roberto Savelli.



Galibo mínimo requerido.

Si considerar mástil, el cual debe ser tipo retráctil

velocity magnitude contours

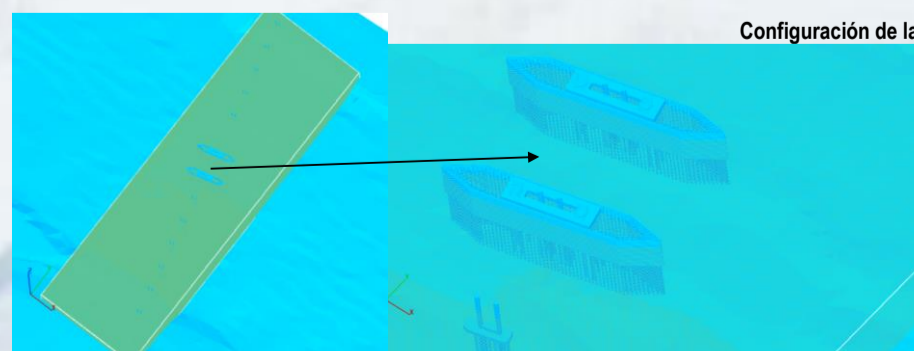


Campo de velocidades a 5 m. de profundidad
(a) Modelo (b) Mediciones de Campo

Modelo Tridimensional con Obras



Configuración de las pilas actuales del puente María Nieves



Límites y configuración geométrica del mallado con obras

HARBOR AND MARITIME ENGINEERING OCCIDENTAL BREAKWATER RECONSTRUCTION, SAN CARLOS ISLAND. MARACAIBO LAKE.

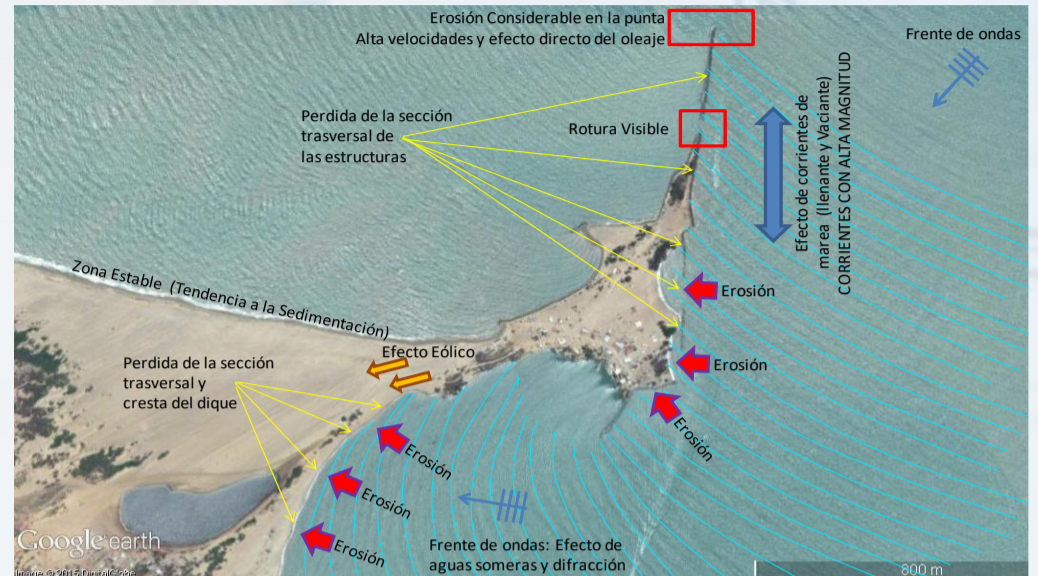
DESCRIPTION

Development of Detailed Engineering for the recovery of the Occidental Breakwater, considering the hydraulic and constructive variables, determining the structural measures, such as coastal protection and stabilization projects needed, taking into account the environmental variables.

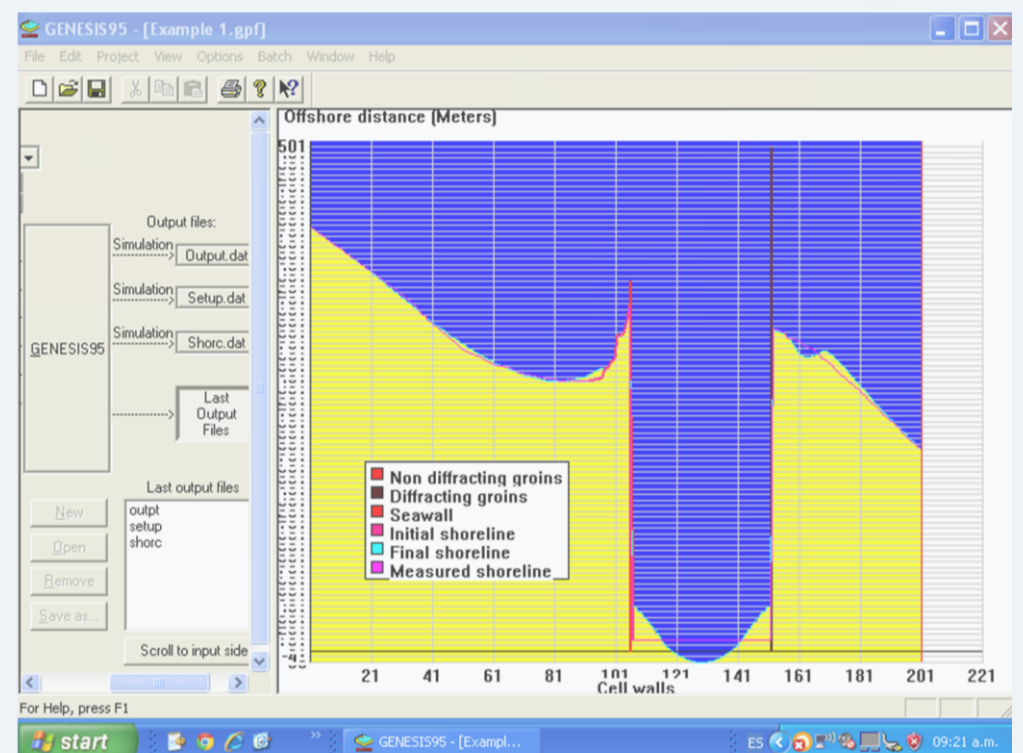
Location: Zulia state, Venezuela. 2015.

SCOPE

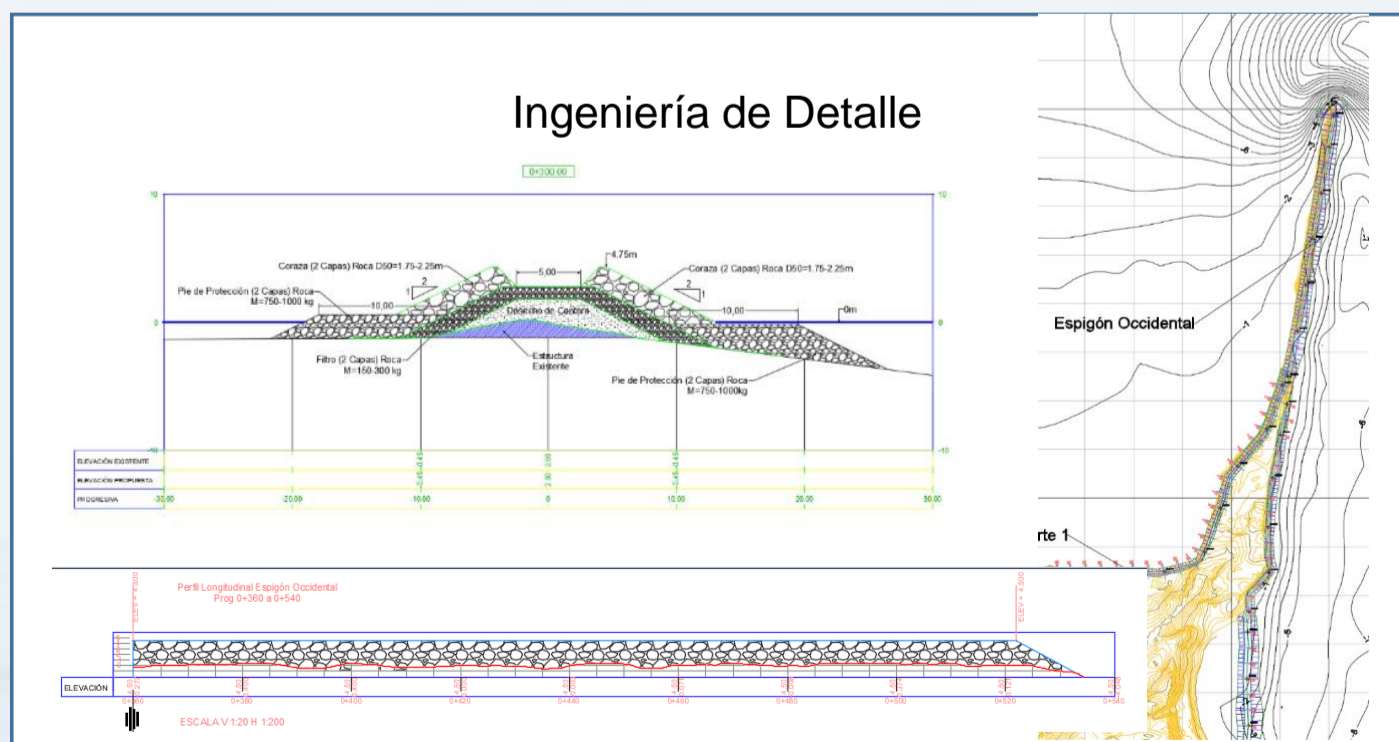
- Field measurements (bathymetry, topography, and currents).
- Coastal Morphology Study. Existing coastal constructions diagnostic.
- Coastal morphology mathematical model application to verify the influence of coastal projects and define stabilization projects.
- Detailed Engineering and Design.
- Environmental Impact Study.



Esquematación de la morfodinámica de la zona de estudio y la problemática de las obras costeras existentes. Fuente: Propia. Imagen Base: Google Earth



Resultado del modelo de la zona norte de isla San Carlos, en base a la condición inicial del año 2015 y resultado o predicción sin la modificación de obras, solo rehabilitación, para el año 2013 (periodo de simulación de 15 años).



Project's Technical Leader:

Mr. Roberto Savelli.

HARBOR AND MARITIME ENGINEERING NVECEM HARBOR DREDGING PROJECT, CUMAREBO 1.169.111 m³.

DESCRIPTION

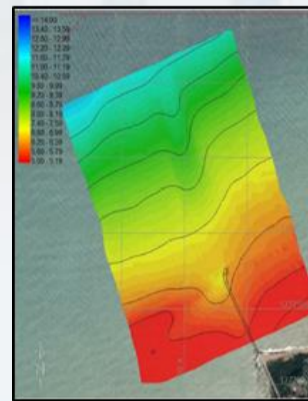
Development of the Dredging Project for the recovery of the main dock to reach the proper depth at the lowest cost and shortest time possible, as well as to audit such dredging operations to guarantee the load operations' safety.

Location: Cumarebo, Falcón state, Venezuela. 2018.

SCOPE

- Pre-dredging bathymetry evaluation and geophysical study.
- Dredging project development (Memory, cost analysis, dredging equipment, dredging methodology, cuts geometry, volumes, annual maintenance, among others.)
- Definition of the dredging equipment, unloading sites, and work methodology.
- Dredging plan development, and planning of pre-dredging activities.

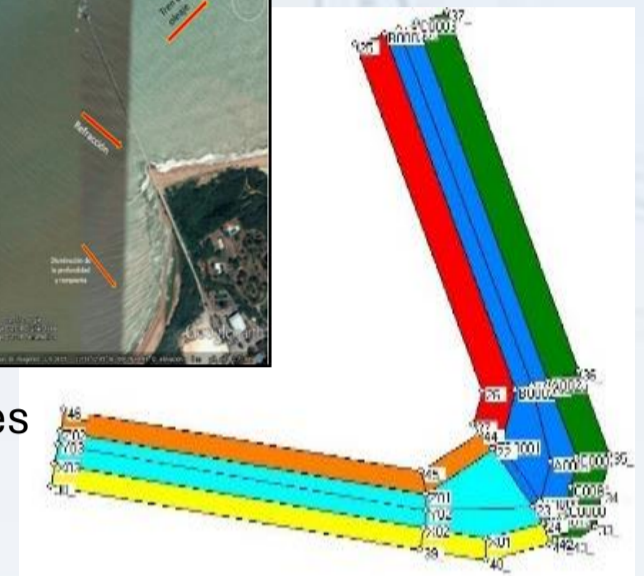
Estudio Batimétrico



Evaluación de la dinámica costera



Dredging Volumes



Dredging Project Sheet

Diseño del Canal Dragado	Datos Iniciales del Proyecto
	Superficie del diseño ±55 has
	Profundidad mínima 5,3 m en el talud sur
	Profundidad de dragado 11,20 m (M.L.W.S.)
	Sobredragado 0,50 m. (Tolerancia)
	Pendientes laterales 1V:10H
	Ancho base de los canales 120,00 m
	Transporte litoral ≥45.000 m ³ /año
	Volumen de dragado 909.497,50 m ³
	Volumen de sobredragado 259.613,80 m ³
	Volumen total de dragado 1.169.111,30 m³

CARACTERÍSTICAS DEL BUQUE TIPO - (modelo base: M/V "Glory Tellus")

DW	20.200 t
Eslora	145,00 m
Manga	25,50 m
Calado máximo (a plena carga)	9,05 m
Calado mínimo (buque en lastre para maniobrar)	5,90 m

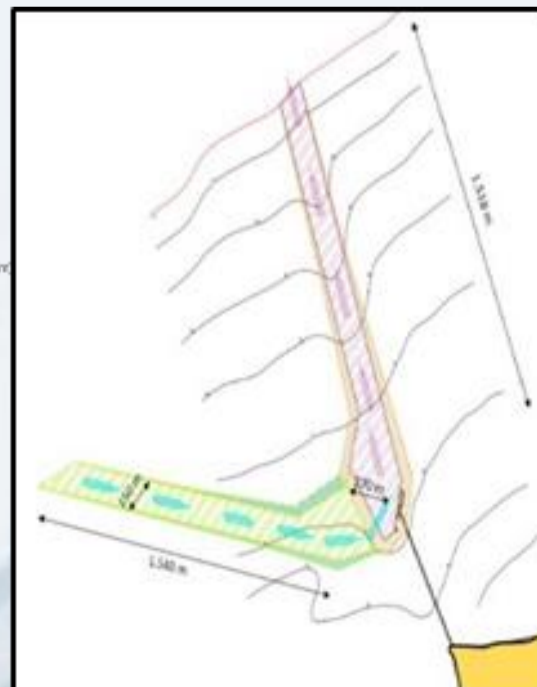
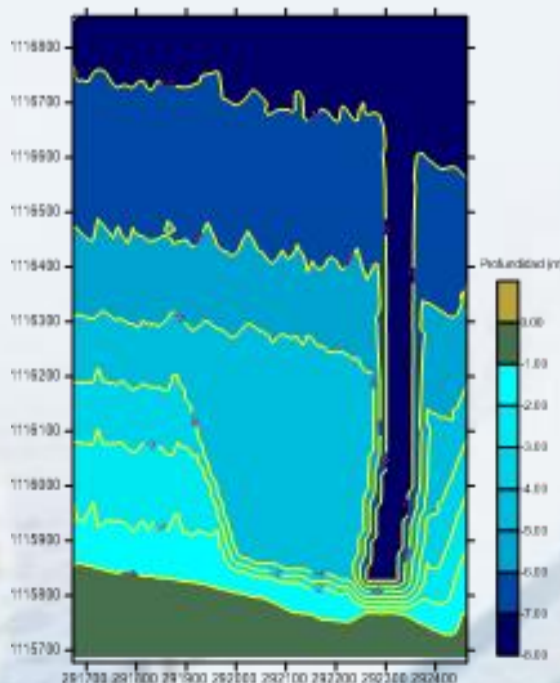
METODOLOGÍA PROPUESTA

FASE ÚNICA	
Descripción	Saneamiento Batimetría pre-dragado. Establecimiento del nivel vertical de referencia única. Exploración magnetométrica y remoción de posibles obstáculos al dragado. Extracción del grueso de material en la zona de maniobras y canales de acceso hasta alcanzar las profundidades diseñadas.
Tipo de draga	Tolva
Rendimiento	23.000 m ³ /día
Trabajo diario	24 h
Descarga	Zona designada a 2,21VN de la costa
Tiempo estimado	3,0 meses

CARACTERÍSTICAS DE LA DRAGA TIPO TOLVA PROPUESTA

Sistema de propulsión Autopropulsada con hélice en proa

Ship Channel Evaluation



Project's Technical Leader:
Mr. Roberto Savelli.

MAINTENANCE DREDGING PROJECT. EL PALITO REFINERY. 915.517 m3.

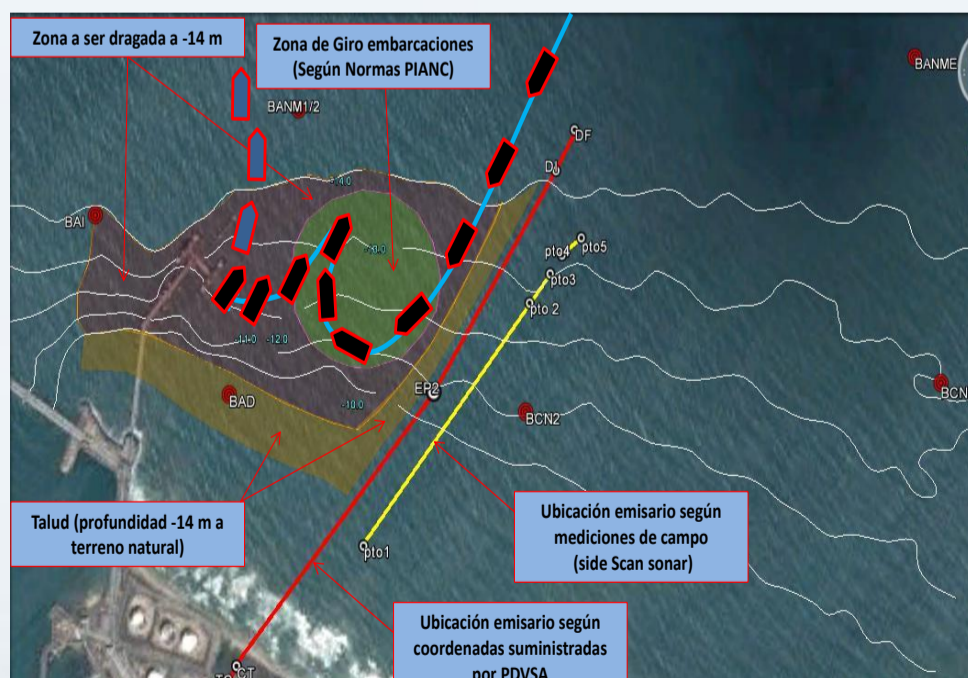
DESCRIPTION

Development of the access channel and maneuvering areas of the No. 1 and 2 decks' maintenance dredging project to provide Depth for ships.

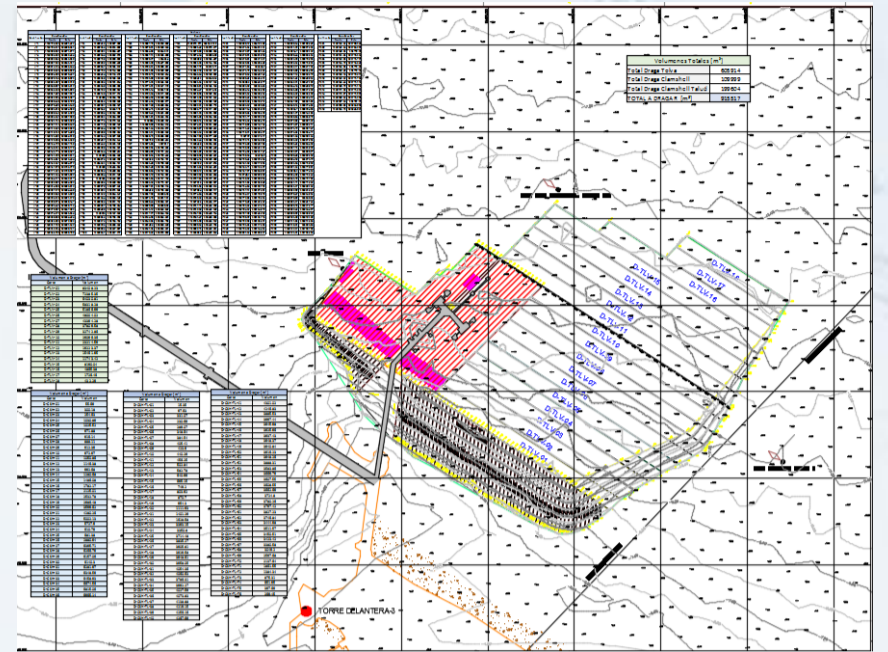
Location: El Palito, Edo. Carabobo, Venezuela. 2016.

SCOPE

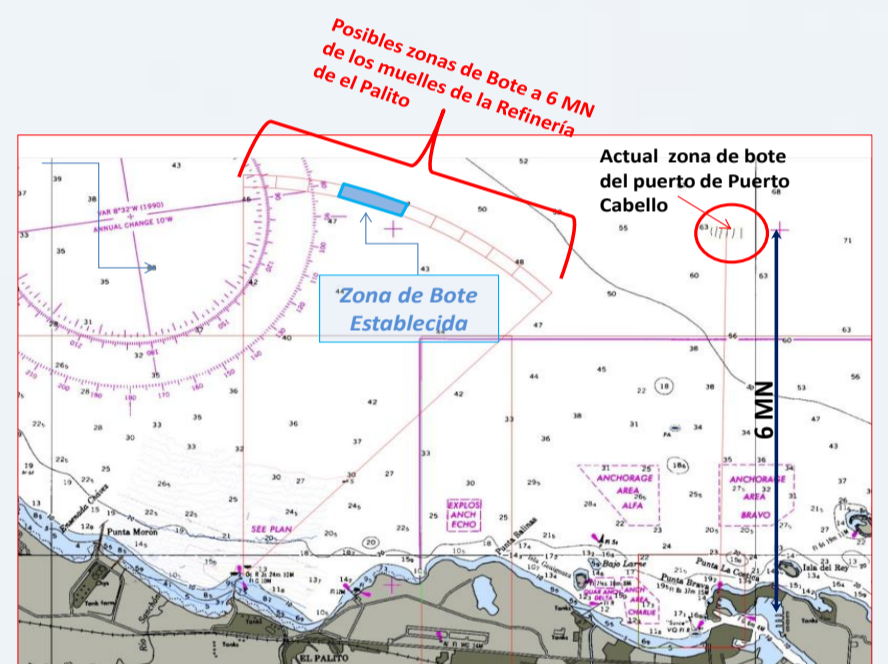
- Pre-dredging bathymetry evaluation and geophysical study.
- Development of the Dredging Project (Memory, Cost Analysis, dredging equipment, dredging methodology, cuts geometry, volumes, anual maintenance, among others.)
- Definition of the dredging equipment, unloading sites, and work methodology.
- Dredging plan development, and planning of pre-dredging activities.
- Environmental Impact Study.



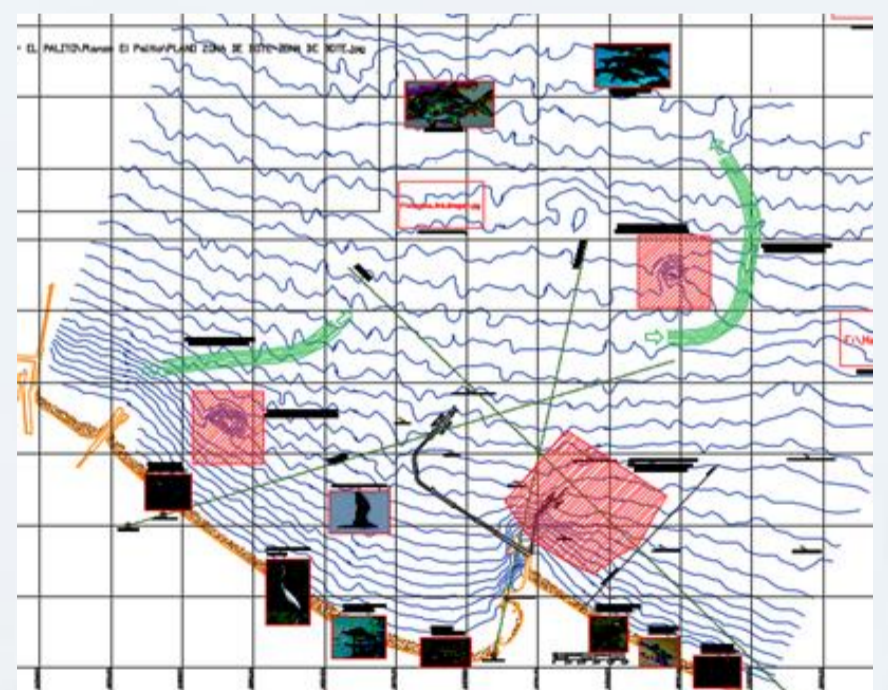
Navigation channel and maneuver pattern evaluation



Boat Zone Evaluation



Dredging of the area



Environmental Sensibility

Project's Technical Leader:
Mr. Roberto Savelli.

HYDRAULIC ENGINEERING- DREDGING DREDGING PROJECT PEDERNALES FIELD - 556.320 m3.

DESCRIPTION

Development of the Dredging Project and hydraulic study to decrease the sedimentation in the ODD and FSPP platforms at the Mánamo pipe and provide depth for the safe transit of ships.

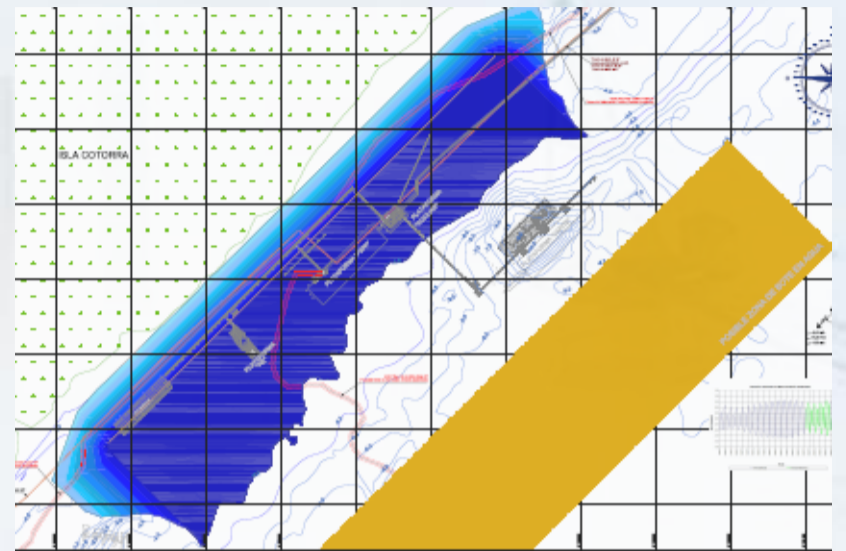
Ubicación: Platforms Odd and Fssp, Caño Mánamo, Delta Amacuro state, 2013.

SCOPE

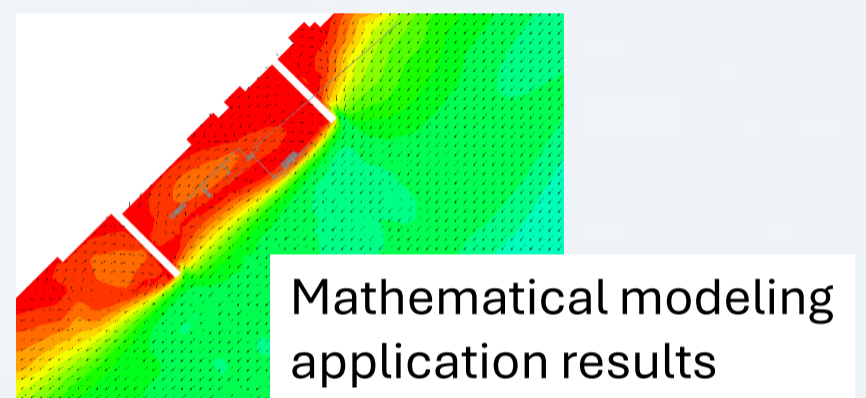
- Field measurements (Bathymetry, Magnetometer, Tide, Sediments, and Flow Study).
- Diagnostic. Definition of the dredged material's waste zone. Access and maneuvers channel design verification. Morphological Evaluation. Hydraulic construction design (Basic Engineering) for the decreasing of the sedimentation
- Development of the Dredging Project (Memory, Cost Analysis, dredging equipment, dredging methodology, volumes, among others).
- Environmental Impact Study.

Project's Technical Leader:

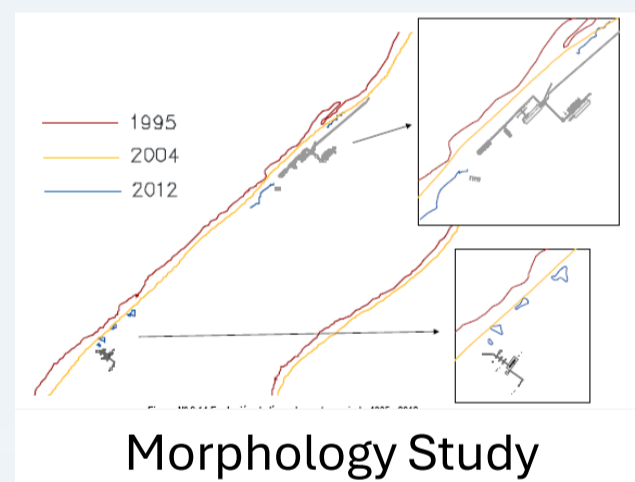
Mr. Roberto Savelli.



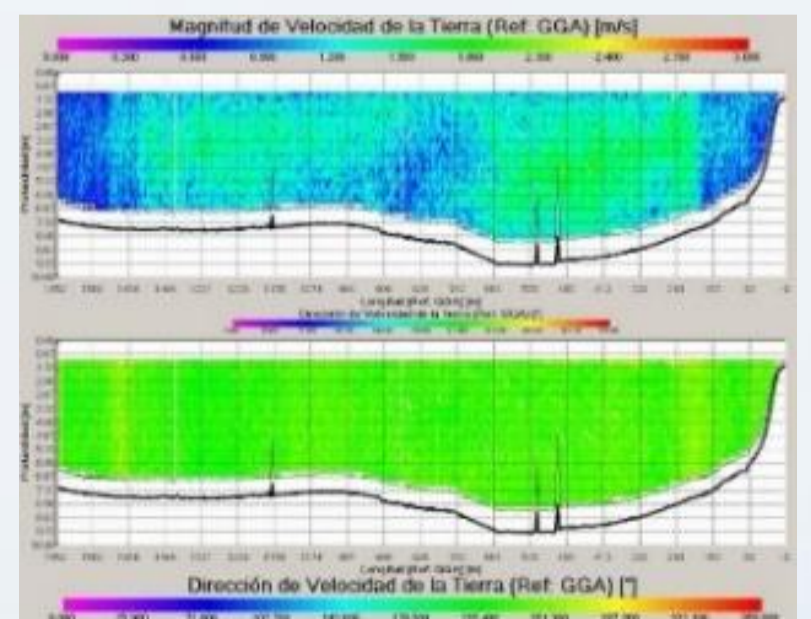
Dredging zone and final disposition of the dredged material



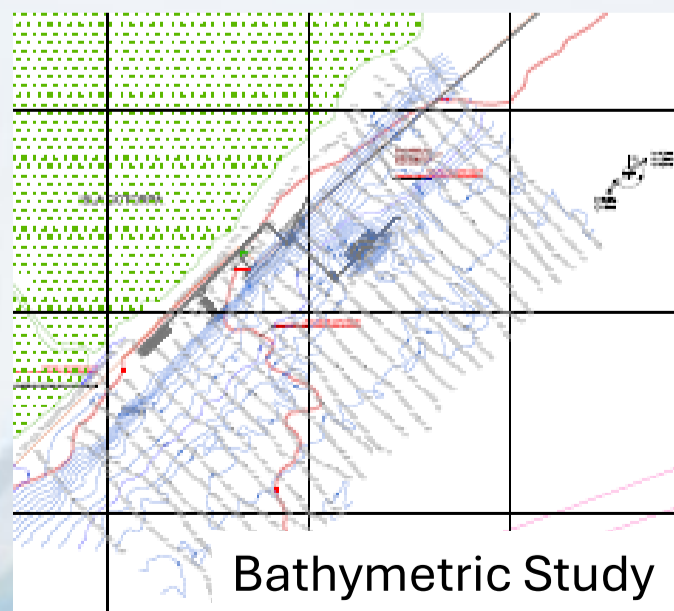
Mathematical modeling application results



Morphology Study



Flow Study



Bathymetric Study

DREDGING INSPECTION OF THE ORINOCO RIVER NAVIGATION CHANNEL. 9.200.000 m3.

DESCRIPTION

Execution of a direct inspection for the CCCC company during the Orinoco River maintenance dredging, mile 184 – mile 0.

Location: Pto. Ordaz, Bolívar state, Venezuela. 2018-2019.

SCOPE

- Verification of the Dredging Plan.
- Daily inspection of the dredging work (equipment, actual dredging progress, location of each dredge, dredging areas, unloading areas, among others).
- Verification of compliance with the dredging program. Control the Dredging Plan (adequacy of the planning to the hydraulic conditions of the Orinoco River and the location and availability of dredging equipment).
- Evaluation of pre-dredging, control and post-dredging bathymetries, as well as dredging volumes.

Project Technical Leader:

Mr. Jesús Paván.



Type of dredge: Trailing suction dredger



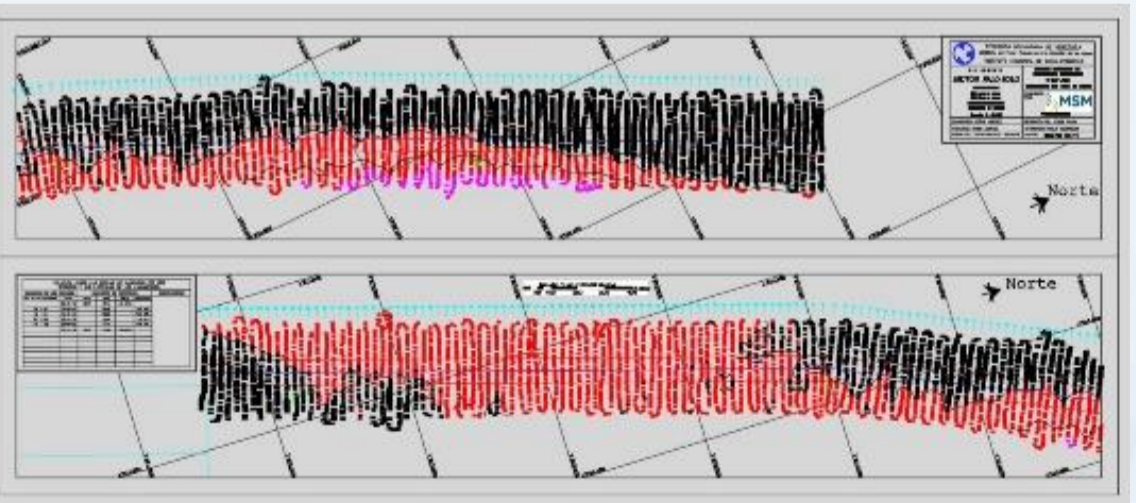
Fuel Intake Control



Check on board of the dredger



Client – Dredging company meetings, Training



Bathymetric Control (Dredging volume quantification)

DREDGING OF THE AUXILIARY PETRO SAN FÉLIX DOCK JOSE INDUSTRIAL COMPLEX. 79.469 m3.

DESCRIPTION

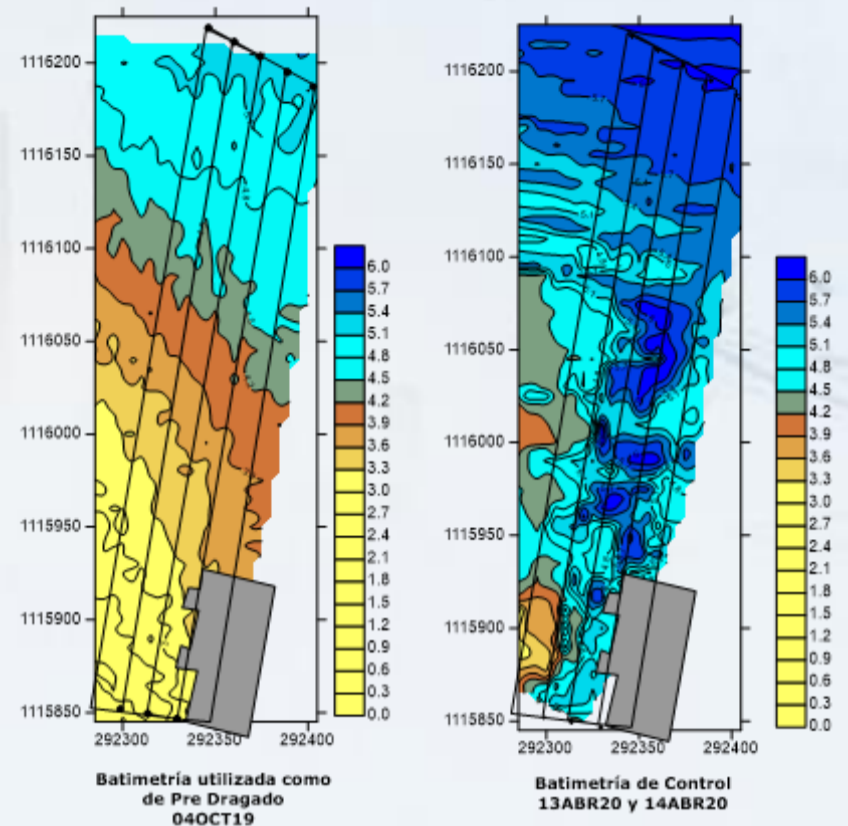
Development and execution of the Dredging Project for Petro San Félix's Auxiliary Dock at a depth of 5,30 meters and lateral slopes of 1V:10H.

Location: Criogénico Jose.

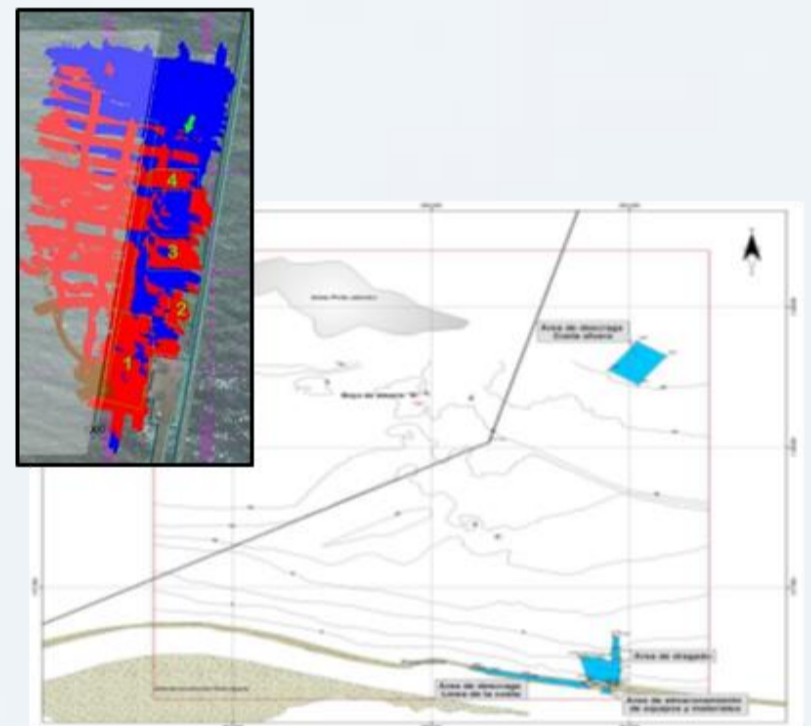
Anzoategui state, Venezuela. 2020.

SCOPE

- Dredging Project (machinery, methodology, volumetric quantification, morphodynamical coast evaluation, unloading area).
- Dredging execution with equipment formed by a Jumbo attached to a Vessel Supply and Split-type barges to transport the dredging material to a predetermined site (Environment) 3 nautical miles to the north. Control and post-dredging bathymetry.



Pre-dredging and control Bathymetry



Unloading area



Project Technical Leader:
Mr. Jesús Paván.

Dredging equipment: Jumbo – Vessel Supply – Split Barge

WOODEN DOCK CONSTRUCTION IN LA TORTUGA ISLAND.

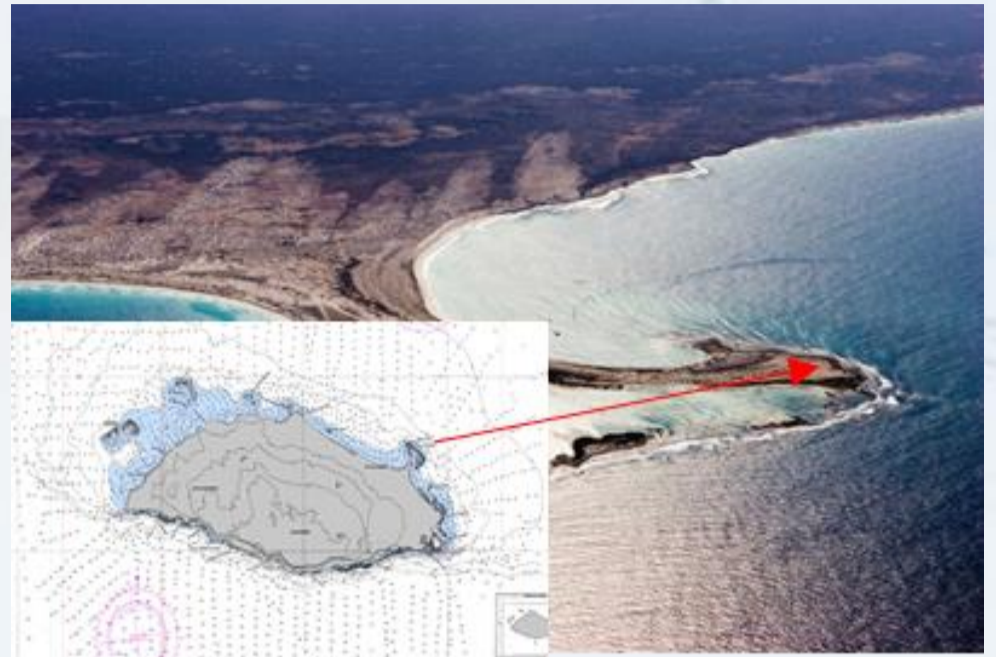
DESCRIPTION

Detailed engineering and construction of a “T” type wooden dock for touristic and recreational use, 25 meters long and 8 meters wide.

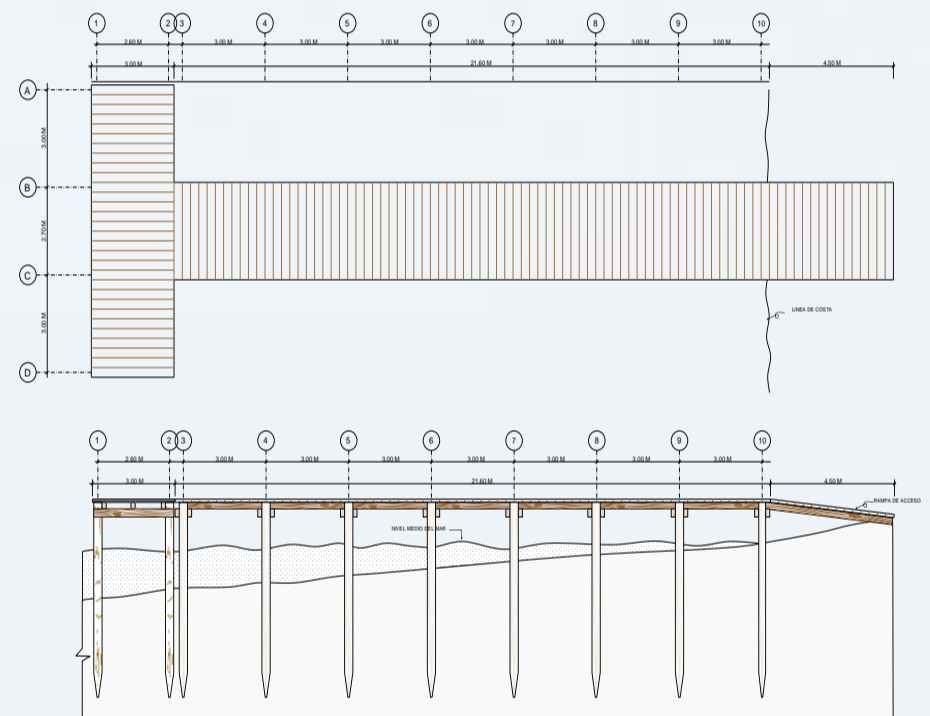
Location: Insular Territory Francisco de Miranda. 2017.

SCOPE

- Design Engineering elaboration.
- Morphological Evaluation of the coastal area for the dock’s construction. Development of the corresponding Environmental Impact Study.
- Considerations for the ships’ fastening.
- Quartering for easy transportation and construction.
- Determination of the logistics necessary due to the complexity of the accessibility to the island.



Dock Location in Punta Larga



“T” type dock design



Project details

Project’s Technical Leader:
Mr. Roberto Savelli.

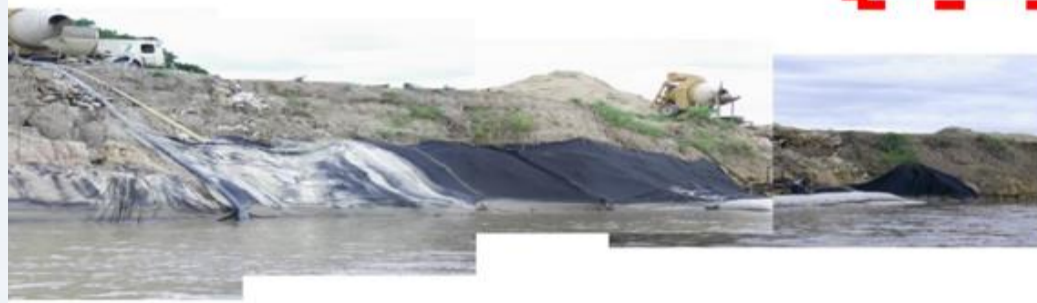
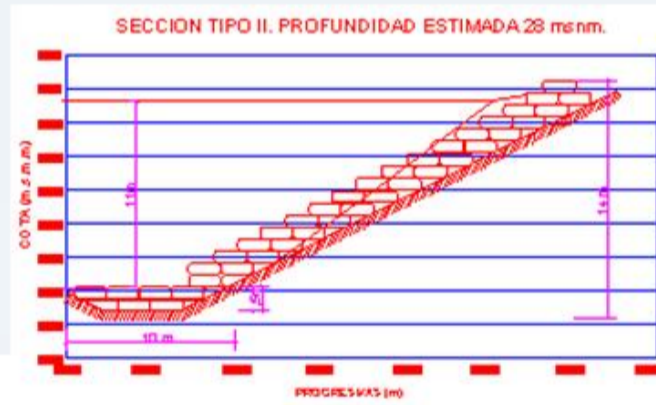
APURE RIVER'S SHORE REINFORCEMENT VIA THE PROTECTION OF THE SLOPE

DESCRIPTION

Control of the river current's flow parallel to the margin to avoid damages by scouring effects in it, so that a curve can be established for navigation and road protection purposes and protect the San Fernando – Arichuna road.

Location: La Tigrera, Apure state, Venezuela. 2007.

Project Detail



Panoramic of the finished concrete coat Project. La Tigrera. Year 2009

SCOPE

- Total Project Length 220,00 meters
- Slope Lining 8,00 meters (from the top level of the road to the Low Water Level)
- Base Lining 11,00 meters (from the Low Water Level)
- Double row of concrete sacks from the low water level to the base.
- Total average height (slope from the road to the base): 19.50 m
- Quantity of concrete sack units: 4310 (3270 of 4 Ton and 1040 of 6 Ton)

Project's Technical Leader:
Mr. Roberto Savelli.

LEADERS' CURRICULAR SYNTHESIS

Professional	Academical Level	Area of Experience	Specialty
Roberto Savelli	Civil Engineer, MSc. Specialist in coast engineering	Hydraulic, Coasts, Dredging, Harbors, Navigation, Constructions	Coast, Harbor, and River Engineering, Navigation Channels, Dredging, Stabilization and Protection Projects, Beach Recovery, Morphology
Jesús Paván	Civil Engineer, MSc.	Hydraulic, Dredging	Dredging Execution and Operation, Dredging Operation Control, Dredging Machinery, Operational Dredging Area, Hydraulics
Carlos Corrales	Civil Engineer, MSc. Specialist in Hydraulics	Mathematic Modelling, Hydraulic	Mathematic Modelling, Fluvial and Maritime Morphology, Fluid Mechanics and Applications, Computer Fluid Dynamics
Carmelo Gil	Hydrometeorological Engineer	Hydrometeorology	Hydrology, Meteorology, Climatology, Use and Administration of Water Resources.
Manuel Azancot	Geological Engineer	Geology, Geophysics	Geophysical Studies, Drillings, Bases, Instrumentation. Geotechnical, Geophysical, and Geological Studies and Scanning
Hilda Morales	Civil – Hydraulic Engineer	Hydraulic, Draining, Aqueducts	Road Drainage, Aqueducts and Sewers, Supply Webs, Draining System, Wastewater Treatment Plants
Jesús Jiménez	Naval Sciences Grad, MSc.	Measuring, Navigation, Instrumentation	On-site Measurements, Navigation, Dredging and Hydrography Inspections, Measuring Equipment, Automatization, Navigation Aid System
Hernán Biord	Bachelor of Sciences, MSc. In Biotechnology, PhD in animal ecology	Environment	Environmental Impact Study, Environmental Supervision Plans, Environmental Parameters Sampling and Analysis, Environmental Components Evaluation