ASSOCIATE ENGINEERS

Excellence at your Hands

Roads and Soil Movement

OPUS INGENIEROS ASOCIADOS

EXPERIENCE IN ROADS AND SOIL MOVEMENT

The core of professionals that form OPUS Associate Engineers today presents a wide experience in multiple projects that involve the Roads and Soil Movement disciplines, executing and supervising projects both in Venezuela and Central America for clients in areas such as Corporations and Public Figures (State and Town authorities), Oil and Petrochemical industries, Food industry, among others.

In this frame they have participated in projects involving the development of:

- Soil movement projects
- Draining system design
- Bridge design
- Geometric road design
- Boundary and signage system design
- Distributor road design
- Road impact studies

We guarantee a high technical level of service through an expert team of multidisciplinary professionals, knowledgeable on the processes associated with this area. Our team relies on the use of specialized technological tools (software), which joined with their high technical qualification, optimizes the response in the execution of our services.

Our team is led by Mr. Waldo Zambrano, who is one of the more qualified and respected professionals in the area in Venezuela, with a successful professional career of more than 40 years.

We will proceed to summarize some of the projects developed by the professionals at OPUS Associate Engineers in the frame of their respective experiences in Roads and Soil Movement.

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Design of a draining system. Acquisition, replacement, and putting into operation the TG-5 and TG-10 Turbogenerator of the Electric Plant in El Tablazo Petrochemical Site.

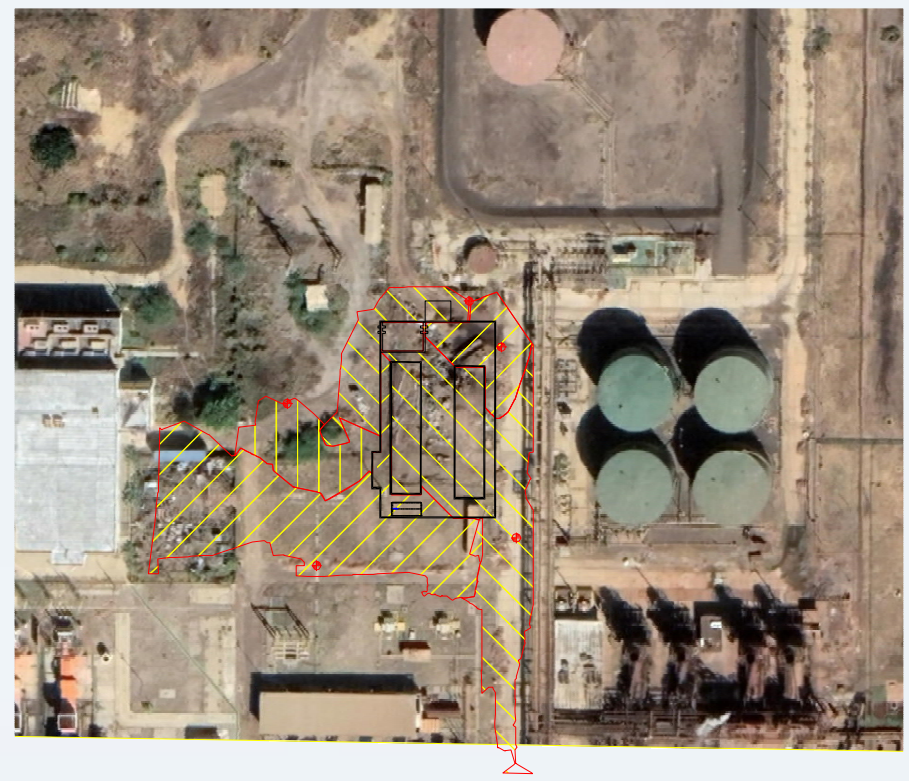
DESCRIPTION

Analysis and design of the Draining System in the assigned area at the Petrochemical Complex Ana María Campos, belonging to Petroquímica de Venezuela S.A. (Pequiven) for the powering of the generation units TG-7 and TG-11, as a part of the “Acquisition, Replacement and putting into operation the TG-5 and TG-10 Turbogenerator of the Electric Plant” project.

Location: Zulia State, Venezuela - 2023.

SCOPE

- Draining around the foundations (Expansion area)
- Runoff study in the expansion area
- Planialtimetric correction for the readjusting of rainwater flow.
- Modified topography development , determining of transversal sections and soil movement on the expansion area.
- External draining for the expansion area.
- Identification of the sub-basins around the expansion area.
- Planialtimetric corrections and reorientation of the low points near or in the expansion area.
- Modified topography development , determining of transversal sections and soil movement on the sub-basins.



SPECIALITIES INVOLVED

- Rainwater draining.
- Road design.
- Soil movement.

Project technical leader:
Mr. Waldo Zambrano

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Consultancy service on the road design for the expansion of the T006 Machiques Colón Highway.

DESCRIPTION

It consists of a road in Venezuela classified as a primary road, which needed an expansion due to the number of vehicles that travel from the Maracaibo, Rosario de Perijá, and Machiques de Perijá districts' capitals, the two latter ones being huge cow's milk and meat producers.

Location: Machiques Colón Highway, Zulia state, Venezuela - 2017.

SCOPE

- Geometric design for the expansion from 2 lanes to 4 lanes (2 lanes per driving direction)
- Corrections in the horizontal geometric design for critical horizontal turns.
- Corrections in the vertical geometric design for the draining points with modified heights and for sections with compromised viewing distance.
- Relocation of the bridge over the Apón River.
- Transversal sections and soil movement.
- Demarcation and signage.

SPECIALITIES INVOLVED

- Road Design.
- Soil Movement.

Project technical leader:
Mr. Waldo Zambrano

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Road design of the Sanitation and Integral Development of the Tuy River Basin Project. William Lara Exchanger.

Location:

Miranda State, Venezuela - 2017.

DESCRIPTION

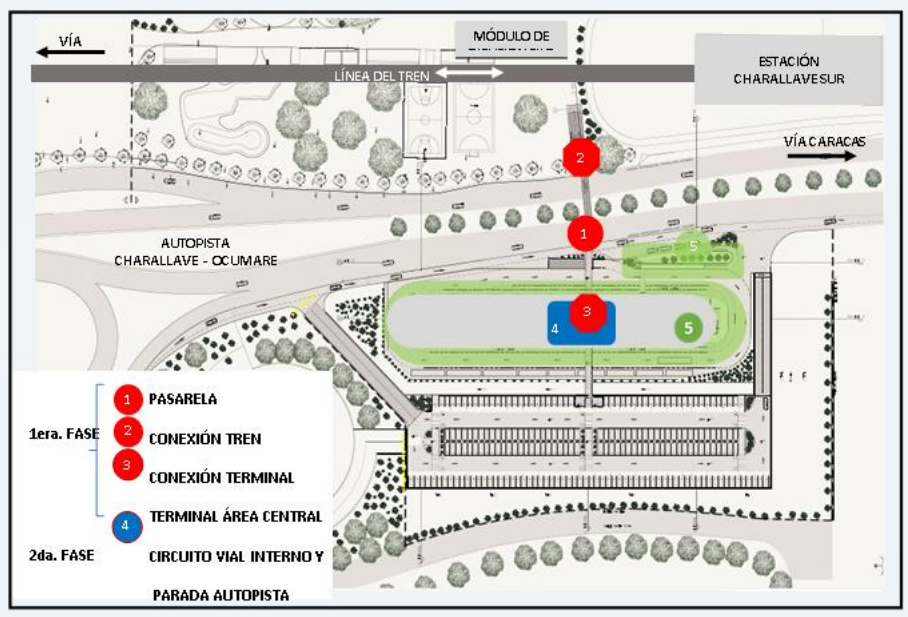
The project contemplates an integral design of the William Lara exchanger, which is composed of a bus terminal with a 3634,02 m^2 construction area and a 6384.87 m^2 parking area, connecting it with the main highway through strategically designed roundabouts and ramps and with pedestrian connection with the Charallave Sur train station via an access ramp and a pedestrian walkway across the main highway.

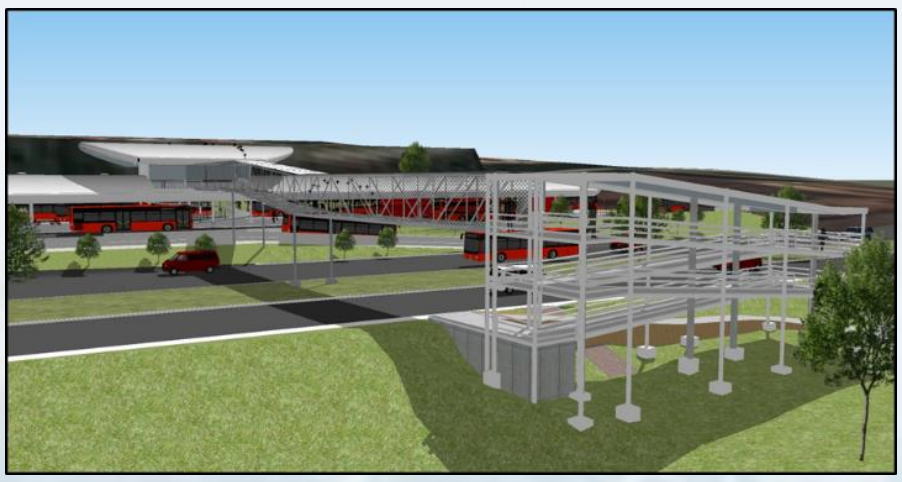
SPECIALITIES INVOLVED

- Topographic Survey
- Soil movement
- Drainage
- Structures
- Road design
- Architecture
- Electricity and lighting

SCOPE

- Geometric road design for the interconnection between the main highway and the passenger terminal.
- Road-related soil movement.
- Integral design of the bus terminal, including its own internal road design.
- Demarcation and signage system design.
- Structural design of the pedestrian connection between the train and bus terminals.
- Landscaping





Project technical leader:
Mr. Waldo Zambrano

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Diseño de Conexión Vía de Acceso Sur con Vía Nacional en la Planta De Distribución Miramar.

Location:

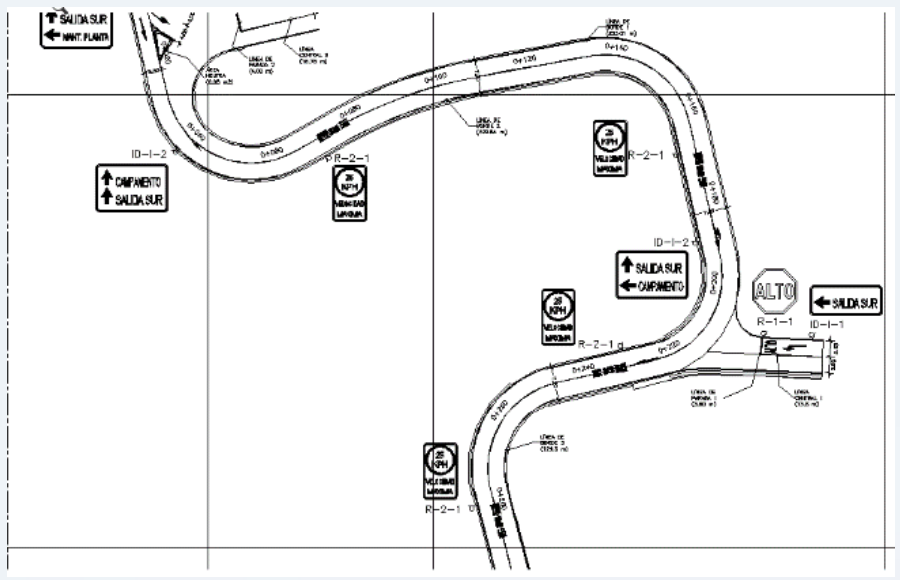
Nicaragua, 2017

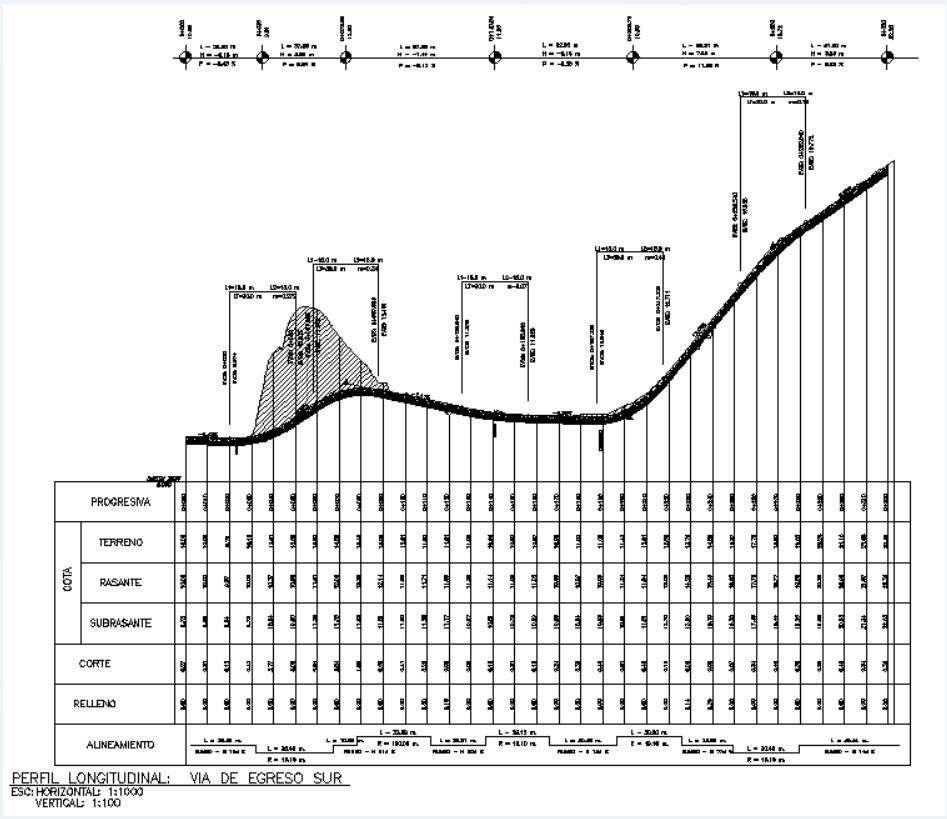
DESCRIPTION

Road design for the connection from the south access of the national highway to the Miramar Combustibles Distribution Plant south-east of Puerto Sandino, Nicaragua, with a span of more than 300 m2. Counting with its respective demarcations, as well as the implementation of drainage systems.

SPECIALITIES INVOLVED

- Topographic survey
- Soil movement
- Drainage
- Structures
- Road design
- Architecture





SCOPE

- Geometric road design from the national highway to the plant from the south access.
- Road-related soil movement.
- Drainage system design.

Project technical leader:

Mr. Waldo Zambrano

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Diseño Vial del Eje de Integración Vial Valles del Tuy Tramo 2 (Oriental): Eje Santa Lucia – Kempis.

Location:

Miranda State Venezuela - 2015.

DESCRIPTION

The project consisted in the design of various viaduct systems for the interconnection as part of the aforementioned project, which takes up 1,6km of viaduct construction, including the bridge over the Guaire River. A width of 28m was considered for the whole road, considering all the existing traffic factors in the area, which includes heavy cargo traffic and trucks. As part of the viaduct design, a set of additional bridges and viaducts were developed in the road distributors considering the upper and lower passages and their respective interconnections.

SCOPE

- Geometric road design of the following viaducts:
  - Bridge over the Guaire river
  - Viaduct at km 33+500
  - Viaduct at km 34+700
  - Viaduct at 37+000
- Geometric road design of bridges and viaducts in multiple distributors
- Road-related soil movement
- Structural design of all the aforementioned elements
- Braking ramps design
- Road lighting system design
- Demarcations and signalization design

SPECIALITIES INVOLVED

- Environmental impact study
- Topographic study
- Soil survey
- Soil movement
- Structures
- Road design
- Drainage
- Road lighting

Project technical leader:

Mr. Waldo Zambrano

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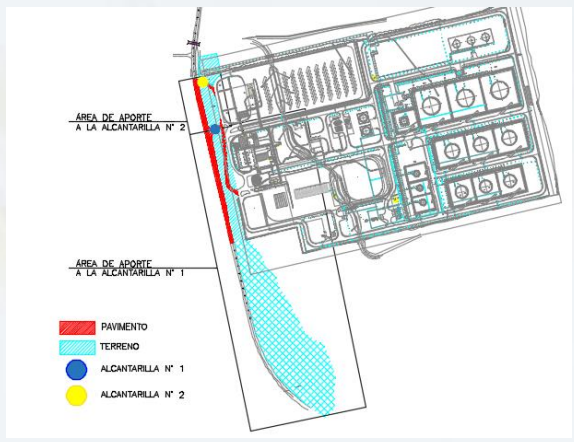
Complementary road designs required by CAMC in the Miramar Distribution Plant

Location:

Nicaragua, 2015.



DESCRIPTION

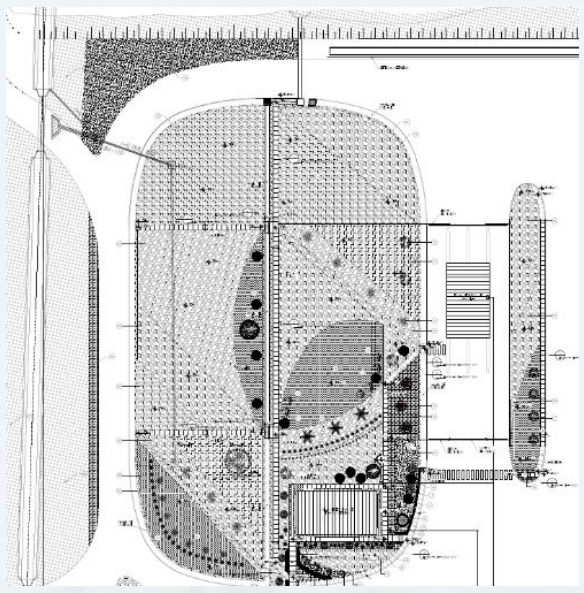
Integral design of the access from the national highway to the Miramar Fuel Distribution Plant, south/east of Puerto Sandino, Nicaragua, including its internal roads, with more than 1000 m^3 of soil movement, more than 600 m^3 of concrete paving, as well as more than 500m^3 of cement sub-base. Counting with their respective boundaries, properly designed lighting, and the implementation of draining and box culvert systems in the required sections.

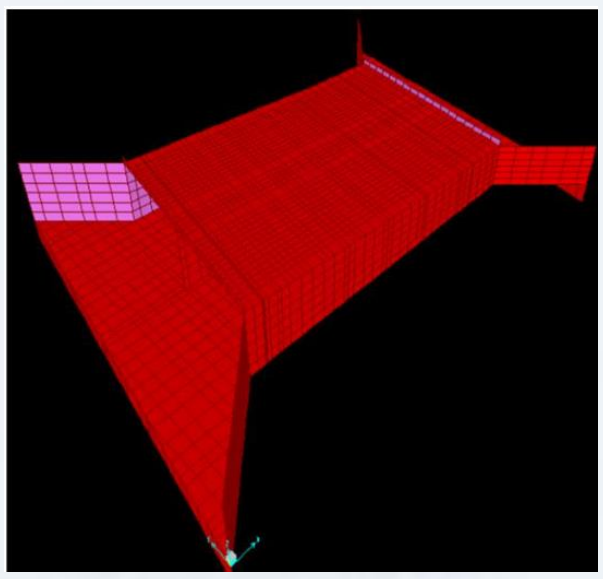
SCOPE

- Geometric design of the roads from the national highway to the plant and of the internal roads of that same plant, which includes intersection design and acceleration and deceleration ramps
- Road-related soil movement.
- Road lighting design.
- Draining system design.
- Structural design for box culvert systems.
- Landscaping design.
- Watering system design.

SPECIALITIES INVOLVED

- Topographic survey
- Soil movement
- Draining
- Structures
- Roadways
- Road lighting
- Architecture





Project technical leader:

Mr. Waldo Zambrano

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