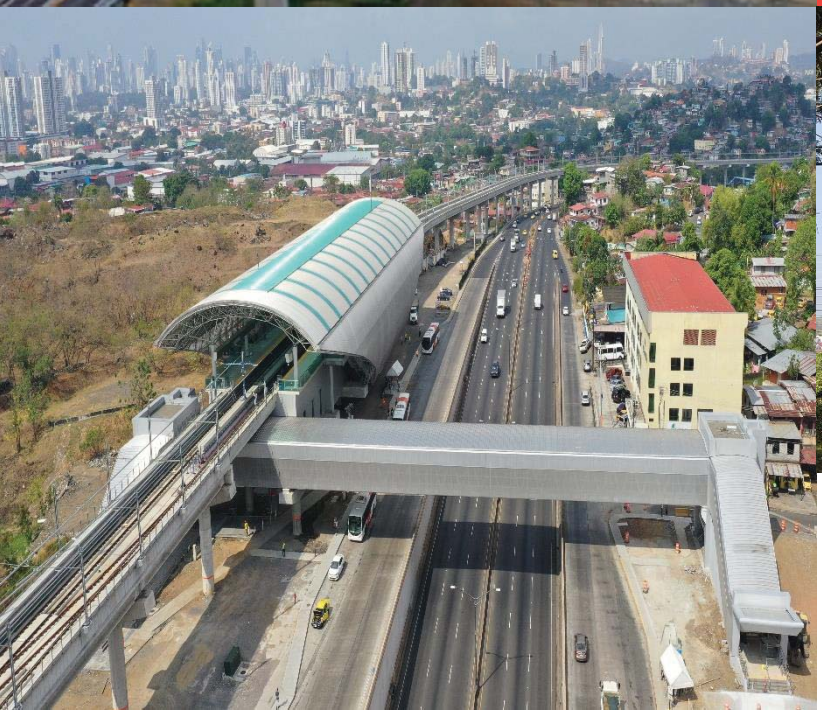
PANAMA OFFICE



LUIS BONILLA BUILDING

116. CITY OF KNOWLEDGE

CLAYTON, PANAMA

T +507-3171892

WSP.COM

WSP's longstanding presence and roster of projects in Latin America have established the company as a leading infrastructure and development firm in the region. WSP leverages the know-how of its engineers, architects, scientists and planners to deliver complex projects on time and on budget in the following markets:

HIGHWAYS AND BRIDGES

WATER & ENVIRONMENT

RAIL & TRANSIT

MARKETS AND SERVICES

BULDINGS AND PROPERTIES

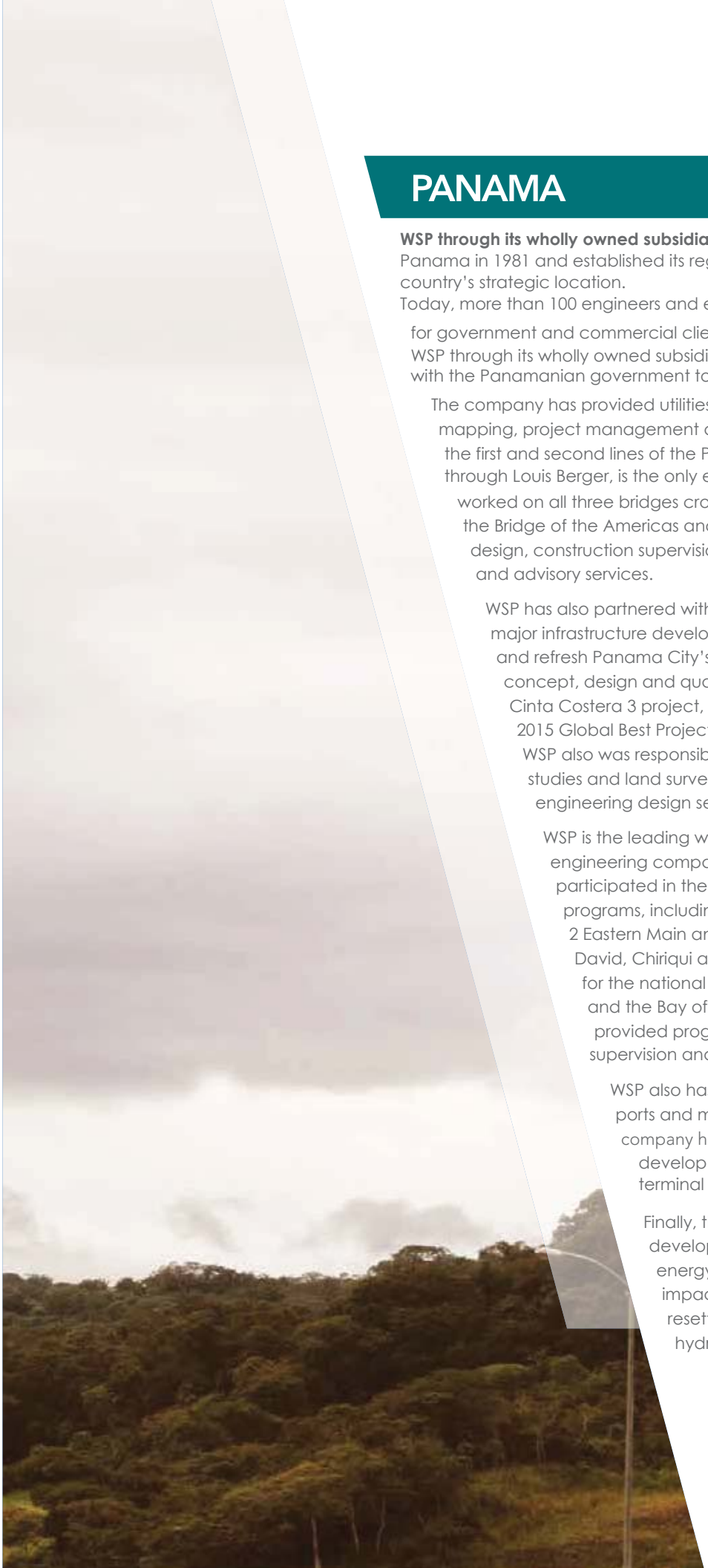
PORTS & ENERGY

GEOTECHNIA & MINING

WSP offers a single source in Latin America for a range of services required for successful program and project delivery, including design, program and construction management.

Backed by capabilities in cost-schedule controls, finance and budget management, cost estimating and information management (IT/MIS), the company operates across 10 major technical service and sub-service areas, including:

- Architecture
- Capacity Building and Technical Assistance
- Heritage Resource Management
- Economics and Financial Services
- Emergency and Disaster Management
- Engineering and Design
- Alternative Project Delivery
- Environmental Services
- Operations and Maintenance
- Planning
- Program and Construction Management



PANAMA

WSP through its wholly owned subsidiary Louis Berger, developed its first project in Panama in 1981 and established its regional headquarters there in 2005 due to the country's strategic location.
Today, more than 100 engineers and experts develop infrastructure solutions for government and commercial clients across all our major markets.
WSP through its wholly owned subsidiary Louis Berger, has a long history of partnering with the Panamanian government to develop the country's transportation network.

The company has provided utilities relocation engineering, surveys and mapping, project management and construction supervision services for the first and second lines of the Panama metro system. Moreover, WSP through Louis Berger, is the only engineering company in the world to have worked on all three bridges crossing the Panama Canal — the Atlantic Bridge, the Bridge of the Americas and the Centennial Bridge — delivering design, construction supervision, inspection, technical assistance and advisory services.

WSP has also partnered with private sector companies on major infrastructure development projects. To ease congestion and refresh Panama City's image, the company provided concept, design and quality control services for the $345 million Cinta Costera 3 project, winner of Engineering News-Record's 2015 Global Best Project in Roads and Highways award. WSP also was responsible for the final design, traffic studies and land survey for the Santiago-Viguí road and the engineering design services for the Cincuentenario Avenue.

WSP is the leading water and wastewater engineering company in Panama. The company has participated in the country's most ambitious water programs, including the Water Supply Works-Group 2 Eastern Main and the water and sanitation works in David, Chiriqui and Santiago de Veraguas. In addition, for the national water agency's investment program and the Bay of Panama sanitation program, WSP provided program management, construction supervision and technical assistance services.

WSP also has significant capabilities in the ports and maritime facilities sector. In 2002, the company helped the Panama Ports Company develop a design-build program to accelerate terminal development at the Port of Balboa.

Finally, the company has had notable successes developing projects in the power and energy sector, completing an environmental impact assessment, feasibility study and resettlement plan for the Changuinola II hydroelectric plant.

THIRD PANAMA CANAL BRIDGE

PANAMA

Two bridges in Panama span the canal, but expansion of the world-renowned waterway involved the construction of a third bridge by 2016. The new bridge in Panama will link the key seaport of Colon to communities to the west of the canal.

WSP through its wholly owned subsidiary Louis Berger, which participated in the design of the two existing Panama Canal bridges, was chosen to design the third bridge and access routes. The firm is working with the China Communications Construction Company/ Highway Planning and Design Institute.

The new bridge will span the Atlantic Ocean entrance to the canal. It features a 1,050-meter dual carriageway, cable-stayed span. The 530-meter main span will be the longest concrete four-lane cable-stayed structure in the world. The east and west approach roads and viaducts will measure 2,031-meter in length. By linking the two regions of Panama, the new bridge is expected to boost tourism, stimulate the local economy and help generate future development.

PANAMA METRO LINE 1 AND 2

PANAMA

WSP through its wholly owned subsidiary Louis Berger was appointed to provide engineering services for the first two lines. After developing the engineering design, surveys and cadaster services of Line 1. WSP through its wholly owned subsidiary Louis Berger was also selected to supervise construction of Line 2.

The new 21-kilometer line is the second of four lines in the government's plan to provide efficient, sustainable transport in metropolitan Panama City, an area of 1.2 million residents. The line also includes 16 stations along an elevated track alignment from an interchange with Line 1 at San Miguelito serving the districts of December 24, among others.

Once completed, the Panama Metro will have three lines in service, which will encircle Panama City. A commuter train will link the districts of Arraijan and Chorrera to downtown and a tram will run through the Coastal Beltway to the Old Town, improving the public transport system and quality of life for citizens.

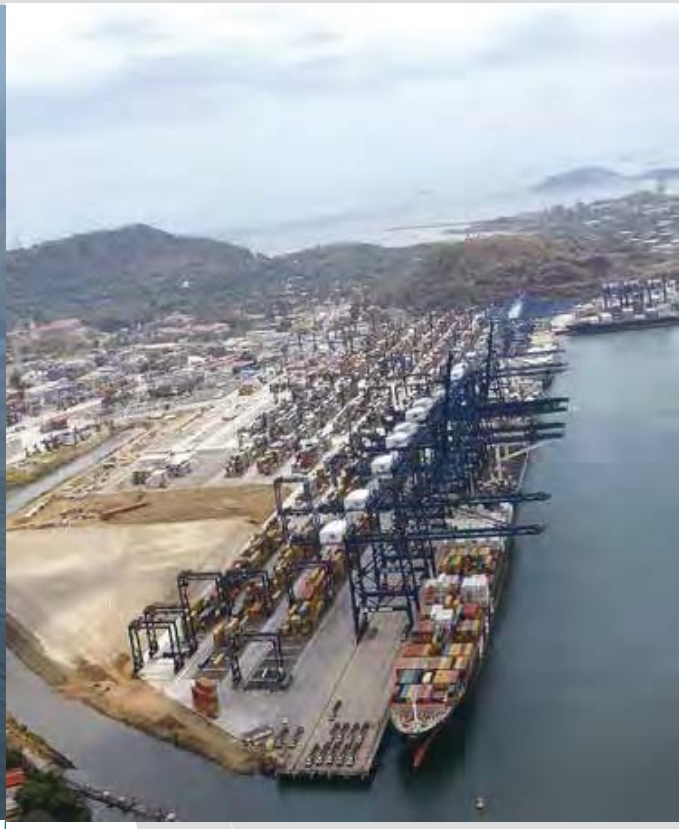
COASTAL BELTWAY
PANAMA

Although a critical part of Panama's urban road network, the Coastal Beltway has few points of access, amenities and green areas. Improving access to Panama City from the Bridge of the Americas would stimulate coastal development and allow residents in the neighborhoods of San Felipe, Santa Ana and El Chorrillo enjoy the city's amenities.

The Coastal Beltway project consisted of two parts. The first was a marine viaduct around the Old Town that forms a narrow band suspended above the water. This part was installed to lessen congestion in central districts, by making it easier to head westwards out of Panama City. The second was a series of roundabouts and traffic-friendly improvements to the multi-lane road leading to Casco Viejo.

WSP provided design, technical advice and quality control services for the $345 million project, which has helped transform the city by improving major axes and road infrastructure in urban areas.

In 2015, the project was awarded Engineering News-Record's Global Best Project in Roads and Highways award.



PORT OF BALBOA EXPANSION
PANAMA

The Port of Balboa is situated at the Pacific entrance of the Panama Canal. The Panama Ports Company (PPC) operates the port, handling general and bulk cargo as well as container cargo transshipments. The PPC undertook an ambitious expansion program to transform the port into a major hub serving Pacific trade routes.

PPC hired WSP through its wholly owned subsidiary Louis Berger to craft an innovative design-build program to accelerate terminal development. The project included a new 450-meter-long berthing wharf and 35-hectare container yard. The development project required dredging, dyke construction, excavation of channels, civil works, as well as design and supervision of the associated power infrastructure.

Upon completion, PPC more than doubled its throughput capacity. The port can now accommodate multiple post-Panamax ships at the dock and has 1,700-meter of quay, 22 super post-Panamax cranes, 57 rubber tired gantry cranes and a container capacity of over 4 million 20-foot equivalent units annually.

IDAAN´S WATER PROGRAM
PANAMA

The Institute of Aqueducts and Sewers (IDAAN) developed an ambitious, environmentally-friendly water and wastewater management program that aimed to improve community health and welfare in Panama.

IDAAN selected WSP through its wholly owned subsidiary Louis Berger to conduct a study prioritizing water and sanitation investments in small and medium-sized cities. The firm performed feasibility studies and final designs for the rehabilitation, improvement and expansion of drinking water transmission and distribution systems in the districts of La Chorrera and Arraiján.

The project provided 500,000 people with access to potable water and sewerage services, and involved the construction of almost
100-kilometer of pipelines and significant improvements to the system's operations.

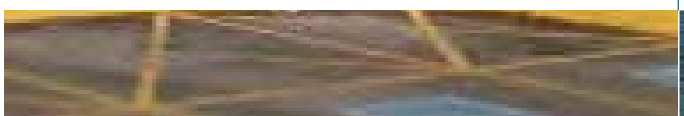
PANAMA BAY PROJECT
PANAMA

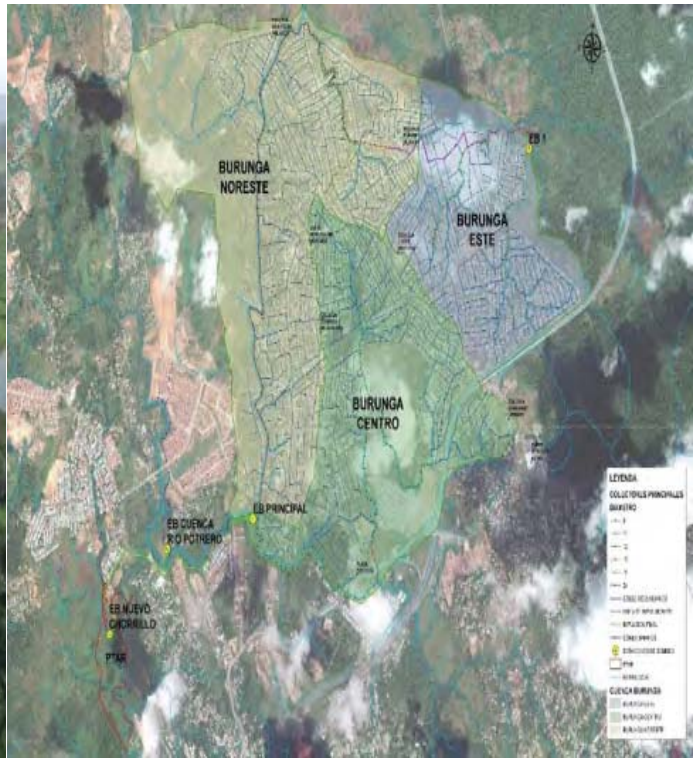
Less than 25 percent of the population in the western areas of Panama City is connected to the local sewerage system, which represents a threat to public health, local rivers and Panama Bay due to risk of contamination from untreated sewage.

The Project Coordination Unit within the Panamanian government has hired WSP through its wholly owned subsidiary Louis Berger to provide project management, construction supervision and technical assistance services for the Panama Bay and City Sanitation Project—one of the most advanced and ambitious sanitation initiatives in Latin America.

WSP is tasked with implementing plans for the collection and treatment of wastewater from Panama City, including proper waste disposal and wastewater management; promoting the responsible use of drinking water; and construction management at river easements. The company has been involved in every major stage of the sanitation initiative—completing basic studies, developing conceptual design alternatives and pre-sizing, and preparing budget, technical specifications and charge sheets for the final design and construction of the sanitation system.

Once completed, the project will result in a cleaner, healthier Panama City and Panama Bay.





RENOVATION FOR THE CITY OF COLON

PANAMA

The Colon Urban Renovation Project of Colon City is a Panamanian Government sponsored project which has three main objectives designed to increase the quality of life for the resident in Colon City, Colon Province, in the Republic of Panama. The agency promoting the project is the Housing Ministry (MIVIOT) which has included three main components in the contract with their contractor:

Due to the social sensitivity of this project, Consortium C3, comprised of WSP and minority partner Gisystems, was contracted by The National Council for Sustainable Development (CONADES) to provide Project Management services to ensure the successful completion of the project within the established parameters of the project. WSP works with MIVIOT to manage the contractor and other stakeholders to ensure that all aspects of the project will be complete.

SANITATION BURUNGA´S SECTOR

PANAMA

The Burunga Sanitation Project considers all the infrastructure requirements for the sanitation system, which is composed by the following:

- Household facilities
- Household connections (8837 houses in Burunga area)
- Minor piping (6"-10") 144 km
- Major piping (12"-40") 19 km
- Pumping (Lifting) Stations 4
- Wastewater pump discharge pipeline 5 km
- Wastewater Treatment Plant (1.0 m3/s capacity)

The estimated population to be benefited by the project is 69.000 inhabitants projected to 2050. WSP through its wholly owned subsidiary Louis Berger was selected, through public tender, by the Coordinating Unit of the Panama Sanitation Program, under the Ministry of Health, to provide Management, Supervision and Technical Assistance Services for the Sanitation Sector of Burunga, Arraiján, located at the west of Panama City

EIS TOCUMEN INTERNATIONAL AIRPORT

PANAMA

Environmental Impact Study for the Tocumen International Airport Expansion

The Tocumen International Airport Company, Tocumen SA, has developed a program for the Tocumen International Airport Expansion, which will ensure continuity and preparedness for the estimates of passenger growth by 2035, and improve the service, to better attend passengers circulating daily.

Tocumen SA hired the Berger Group to conduct the Environmental Impact Assessment and submit an EIS that meets the requirements of: the Terms of Reference for a Category II EIS according to Executive Decree No. 123, general Environmental Specifications, Compendium of Laws and decrees for Environmental Protection and Other Provisions Applicable to construction.

CAUSEWAY OF AMADOR

PANAMA

The project consisted of the elaboration of preliminary and final designs for the expansion of the Causeway which joins the Flag Monument and the Naos, Perico and Famenco Islands; from 2 lanes to a 4 lane road. The road length is approximately 4.0-kilometer and the project included the design of pedestrian and cycle way facilities, a recreation park, the construction of parking areas, and a number of traffic circles to provide viewpoints, parking facilities and traffic calming features. The project also included the relocation of services, provision of drainage system, sea fill to widen the road platform, provision of street lighting, etc.

WSP developed preliminary studies and designs for the construction, improvement and expansion of the Amador road between the Flag Monument and the entrance to Isla Flamenco.

CHANGUINOLA II HYDROELECTRIC DAM

PANAMA

Panama's National Energy Agency and other relevant actors proposed the Changuinola II Hydroelectric dam to increase energy independence, promote sustainability and meet Panama's rapidly growing energy needs.

WSP has been selected to conduct a feasibility study and environmental impact assessment for the dam. The firm conducted topographic surveys; geological, geotechnical, hydraulic and hydrologic studies; economic and financial analyses for construction and operation; layouts for site infrastructure, including access roads, transmission lines and construction camps; and public outreach to affected communities.

The 166-meter-high dam will create a 19-square-kilometer reservoir to produce power for 90 consecutive days with an installed capacity of 214 megawatts.

Upon completion, the project will account for 15 percent of Panama's hydropower capacity and nine percent of the country's total electricity capacity. It will reduce Panama's oil consumption by 1.5 million barrels annually and carbon dioxide emissions by 600,000 cubic tons per year.

PANAMA PACIFICO

PANAMA

In July 2007, the Government of Panama, in a process coordinated by the World Bank, selected London & Regional Panama SA (LRP) as the Master Developer for the redevelopment of the former US

Howard Air Force Base. As the successful bidder, LRP was awarded a long term concession to develop the site into a major new community with over one million square meters of commercial development,

20,000 homes and over 1,000 hotel rooms.

LRP appointed separate specialist master planning consultants and architects for the Master Plan development sub-areas and selected the Berger Group as the Infrastructure Engineer in charge of the liaison and coordination with these consultants, providing engineering advice and support for their designs. As such, WSP services included the following aspects: Utility services, Civil engineering works associated with the utility services, Security and access systems, Earthworks & landscaping, Strategy for Site Wide Infrastructure, Concept Design of the site wide Infrastructure, Concept Design for the Sub-Development Zone Infrastructure, Final Design for Selected Areas within the Sub-Development Zone Infrastructure.

BRIDGE OF THE AMERICAS

PANAMA

The Bridge of the Americas is the most important steel structure in the roadway system of Panama and Central America. The 1,654 m bridge has a 343 m cantilever trussed-arch main span with two lane accesses in both directions, it averages 42,668 vehicles per day, and communicates Panama City with a large part of the interior and with Central and North America. The bridge dates from 1962 and was subject to a previous inspection in 1993.

WSP, together with several subcontractors both from US and Panama, were awarded the contract on the basis of the Best Value Proposal.

The work consisted of performing consulting services for The Bridge of The Americas' inspection (which included the preparation of an Engineering Inspection Report). The Contractor furnished all labor, material, analytical tools, travel and incidental services necessary to perform all work and services in accordance with the scope of work.

CENTENARIO BRIDGE

PANAMA

WSP through its wholly owned subsidiary Louis Berger in a consortium with T.Y.LIN, was contracted by the Ministry of Public Works to provide engineering services, including surveys, designs, plans, and specifications, for the construction of a second bridge "Puente Centenario" (Cable-stayed bridge, Total Length 1,052m, Longest span 420 metres, Vertical Clearance 80m, 6 lanes) across the Gaillard Cut of the Panama Canal.

A conceptual design based on the Schematic Design was prepared as part of a previously approved proposal.The preliminary design was then developed following the approval of the Conceptual Design.

WSP provided construction recommendations including: detailed specifications and construction procedures; specifications on criteria for acceptance/rejection/liquidated damages; development of calculation reports for each of the studies; development of details for the complementary Details of Project and Documents; detailed description of the procedures and timetables of the project's Details.

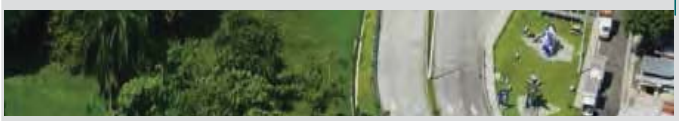
Aside from these services, the Consortium also developed final plans for the stretch of highway on both sides of the bridge from, including two interchanges, and an Environmental Impact Study.

CINCUENTENARIO AVENUE DESIGN
PANAMA

The scope of the services delivered by WSP for the Project were mainly the definition of the urban outline solution, preliminary design and new outline of the vía Cincuentenario, in the sector of Panama Viejo, with a total length of about 2,1 km. preparation of the Environmental and Social Impact Assessment, considering the needs of affectations to the adjacent communities and including Archeological Assessments for the site characterization of the Panama Viejo ruins and rescue of historical elements bordering the project, Hydrological/hydraulic assessment, Supervision of Geotechnical Studies, Geometrical Design, Structural Design, Storm sewer and drainage systems design, utilities relocation and traffic signalization designs and Monitoring the Project execution during the construction stage.

SANTIAGO - VIGUI ROAD DESIGN
PANAMA

The Western Pan-American Highway (CPA) is currently the main axis of the road network of the Republic of Panama, through which all land transportation from North and Central America to the Panama Canal area travels.
The Santiago-Vigui stretch is the only section of the Western CPA that was maintained with a single roadway design, and it was necessary to expand it to provide the road with adequate traffic conditions, both in terms of capacity to manage the volumes of traffic projected and in relation to the safety conditions that it must provide for this purpose.
For the purposes of this project, a multidisciplinary team of specialists evaluated the road in all its structural and functional aspects, having carried out numerous studies, tests, trials and surveys to obtain a detailed knowledge of the site, the conditions of the infrastructure and the problems that need to be addressed from the design of both the rehabilitation of the existing road and bridges and the new roadway and bridges to be built for the expansion.



Third Bridge across the Panama Canal

Location |	Panama
Client |	Panama Canal Authority
Dates |	2011-2015
Construction Amount |	US$365 Millions
Contract Amount |	US$11,1 Millions
Area |	Transportation, Bridges, Highways
Service |	Engineering design Construction supervision Inspection services

Panama, located at the southernmost point of Central America, is situated in the isthmus that connects North America with South America. Various plans were followed to build a canal in the strategic Panama but they were given up by the King of Spain in 1534 and by the French Ferdinand de Lesseps in 1888. Afterwards, the United States finished the canal in 1914. It currently serves to 17,000 ships and 300 millions of tons of annual cargo.

Challenge

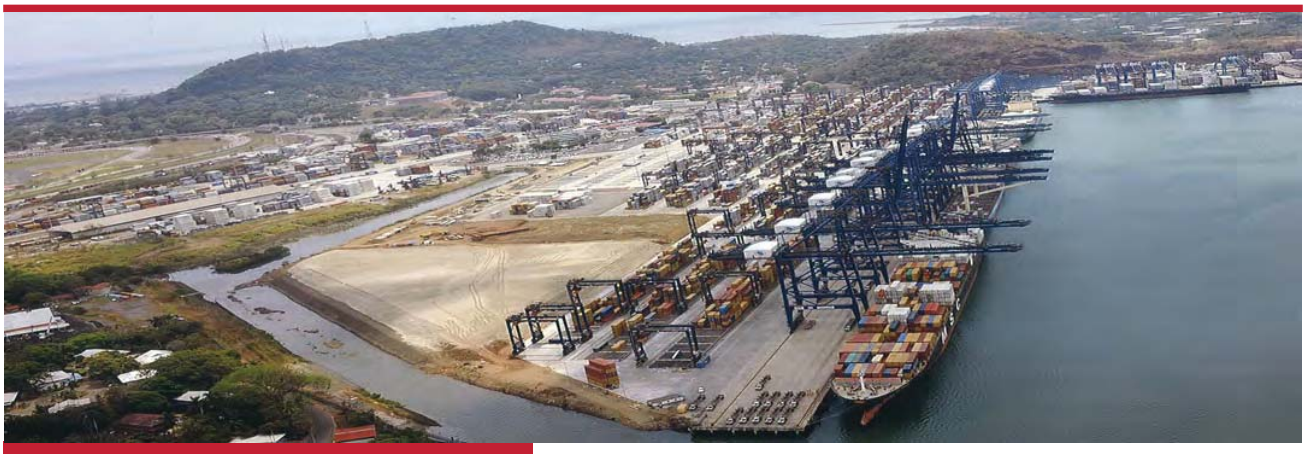
Two bridges in Panama cross the canal but the widening of this world renowned waterway required the construction of a third bridge by 2016. The new bridge in Panama will connect the key port of Colon with the communities at the West side of the canal.

Solution

WSP, that has been involved in the design of the two existing bridges that cross the Panama Canal, was selected to design the third bridge and its access roads, as well as to provide the inspection and consulting services during the bridge construction. The company is working together with China Communications Construction Company/ Highway Planning and Design Institute.

The new bridge will cross the entrance in the Atlantic side to the canal. Its main features are a double lane of 1050 meters, cable-stayed bridge. The 530 meters main span is the longest cable-stayed structure with four concrete lanes all over the world. The East and West approaches and the viaducts will be 2031 long. As the two Panama regions will be linked, the new bridge is supposed to encourage the tourism, to stimulate the local economy and to collaborate in the growth of a future development.

Port of Balboa



Location | Panama

Client | Panama Ports Company

Dates | 2006-2015

Construction Amount | US$400 Millions

Contract Amount | US$12,6 Millions

Area | Transportation
Ports

Service | Construction supervision
Inspection services
Engineering design
Environmental Impact Assessment Administration and Organization Programs
Administration and Construction Procurement/ Tender Documents Land surveying/Land registry

Panama Ports Company, a subsidiary of Hutchinson Ports Holdings (HPH), the world's largest independent port operator, selected WSP to provide engineering services related to the expansion of the Port of Balboa (Phase 4) located in the Pacific end of the Panama Canal, a container terminal moving 7 million tons of cargo per year. After completing all phases of the modernization program, Balboa Port has 1,500 meters of deep-water quay, 50 hectares of container storage area, 12 super post Panamax quay cranes and 28 RTGs.

The scope of the works comprised:
Marine works development: where around 5,800,000 m3 of sediments, 200,000 m3 of weathered rock and 570,000 m3 of hard rock were removed (dredged) and 4,240,000 m3 of sand were imported for reclamation.
Land base works development: as the demolition of the structures of the docks 18 and 19 and other structures; the construction of the quay 18 deck for the vessels berthing and port Panamax cranes operating, the construction of retaining structures to rear of Berths 16 and 17; the culverting of approximately 598 m of the Maria Salas River and construction of approximately 551 m boxed culvert of the Curundu River, the construction of sound isolating wall of 780 m long to mitigate the environmental and civil impact of the works for the neighboring community of Diablo; the construction of retaining structures to support reclamation area and the disposition of dredged and unsuitable materials in the assigned area.

To the same extent, several phases concerning electrification and transforming of the RTG cranes that operate in the container yards have been developed, in the aim to reduce operative costs in the fuel consumption and to increase the efficiency and productivity reducing also the pollution rates.

Infrastructure and services engineer for the Howard base development - Phase 1A

Location | Panama

Client | London & Regional Properties – Panama

Dates | 2008-2013

Construction Amount | US$705 Millions

Contract Amount | US$1.1 Millions

Area | Transportation
Roads

Service | Feasibility study
Engineering design
Land surveying/Land registry

London & Regional Panama (LRP) was selected by the Government of Panama for the development of the former US Howard Air Force Base. As the successful bidder, LRP was awarded a long term concession to develop the site into a major new community with over one million square meters of commercial development, 20,000 homes and over 1,000 hotel rooms. The overall development features high quality architecture complemented by leisure facilities.

LRP appointed separate specialist master planning consultants and architects for the Master Plan development sub-areas and selected the Berger Group as the Infrastructure Engineer in charge of the liaison and coordination with these consultants, providing engineering advice and support for their designs and carrying out the development of the Phase 1A that included the utility services development and the associated civil engineering works; security and access systems and earthworks & landscaping , to be achieved in the following phases:

- Phase A –Strategy for site wide Infrastructure
- Phase B – Concept Design of the site wide Infrastructure
- Phase C – Concept Design for the Sub-Development Zone Infrastructure
- Phase D – 100% Final Design for Selected Areas within the Sub-Development Zone Infrastructure

Cinta Costera in Panama City

Location | Panama

Client | Construtora Norberto Odebrecht

Dates | 08/2011 - 03/2014

Construction Amount | US$345 Millions

Contract Amount | US$1,2 Millions

Area | Transportation, bridges, highways, recreational urban design

Service | Conceptual and Final Design
Quality control

The Cinta Costera in Panama City is an important part of the new urban road network, connecting the South Corridor with the Western area of the Panama Province and allowing a more fluid traffic flow to and from the Panamerican highway.

Challenge

To create an alternative to get into Panama City from the Bridge of the Americas. To stimulate the coastal development with green areas and increase the value of neighborhoods San Felipe, Santa Ana and El Chorrillo.

Solution

The Cinta Costera renewed the city's appearance, improving the different connecting axes and adapting and building new road infrastructures in critical points and new urban spaces.

WSP carried out the engineering designs for the infrastructure of a 1.6 Km long new urban avenue with a marine fill of about 25 Has. The neighborhoods of El Chorrillo, Santa Ana and San Felipe gained a more direct and fluid road and urban connection, with green areas, parks, sports areas and pedestrian ways.

WSP made the final road design of the link with the marine connection in front of the Fish Market, solving the intersection of Avenida Balboa towards the Cinta Costera and the junction of the Cinta Costera with the marine viaduct that circles the Casco Antiguo.

WSP also developed the quality control of the design and technically advised the Contractor during the construction of the new marine viaduct, which has 2.6 Km and three lanes in each direction.

It also has a pedestrian walk and a bike lane, allowing the users to enjoy and appreciate the view of the new Casco Antiguo perspective.

Studies and designs for the improvement and expansion of the Amador causeway

Location | Panama

Client | ININCO, S.A.

Dates | 2013-2014

Construction Amount | US$66,5 Millions

Contract Amount | US$1,6 Millions

Area | Transportation
Roads

Service | Preliminary Studies
Environmental Impact Studies
Preliminary Design
Final Design

WSP performed the studies and preliminary and final designs and the environmental assessment for the construction, improvement and widening of Amador causeway, between the monument to the Flag and the entrance to Flamenco Island.

The scope of the works that were developed included:

- Topographic, soils, geology and geotechnic studies of the existing and the new causeway
- Definition and design of the roadway geometric sketch, including intersections and returns
- Generation of the final Digital Terrain Model (DTM)
- Calculation of the fill volume for the new causeway construction, parks, recreation areas and parking
- Pavement calculation and design
- Longitudinal and cross drainage calculation and design along the project
- Structures calculation and design
- Road Safety measures, design safety signs, markers and Protections)
- Production of the Plans of Works Sign posting and traffic regulations
- Production of the calculation Techniques memories and reports
- Quantity estimation of Works
- Preparation of the General and Specific (particular) Techniques document

Santiago-Viguí Road

Location | Panama

Client | Construtora Norberto Odebrecht S.A.

Dates | 01/2014-12/2014

Construction Amount | US$339,5 Millions

Contract Amount | US$3,4 Millions

Area | Transportation
Roads

Service | Topographic surveys
Traffic surveys
Final design

WSP carried out the topographic surveys and final designs of the Santiago-Viguí road.

The scope of the works that were developed included:

- Development of the topographic surveys of the 72 km project
- Generation of the final Digital Terrain Model (DTM)
- Inspection and inventory of infrastructure and property register of the existing public utilities
- Review of the horizontal alignment and the slope of the new road developed in the preliminary design
- Review of the traffic, volumes and weights survey
- Data processing of the traffic surveys
- Plan preparation and analysis of geotechnical researchs
- Redefinition and optimization of the horizontal and vertical alignments
- Identification of the concerned properties and utilities
- Optimization of the slopes on new vehicular bridge zones
- Compilation of the project meteorological information
- Hydrologic and hydraulic survey to determine the drainage and bridge structures dimension
- Design of the new road geometry including intersections, U-turns and longitudinal drainage of the new geometry
- Design of the drainage structures
- Design of vehicular bridges across the rivers San Pedro, San Pablo, Santa Clara, Cobre and pedestrian bridges
- Design of safety measures including horizontal and vertical traffic signs, lighting, quantity estimation of works, preparation of drawings and specifications

New Section of the Avenida Cincuentenario

Location |	Panama
Client |	Construtora Norberto Odebrecht S.A.
Dates |	2011-2013
Construction Amount |	US$185 Millions
Contract Amount |	US$1 Million
Area |	Transportation Highways
Service |	Engineering Design

WSP was selected by Constructora Norberto Odebrecht to carry out the design of the new sketch and environmental impact assessment of the Avenida Cincuentenario in Panama, developing the following tasks:

- Definition of the urban sketch solution and preliminary design of the new sketch with an approximate length of 2,1 km
- Representatives of the Contractor in the presence of public and private entities and presentation of design alternatives
- Environmental impact, social and archeological assessments
- Hydrologic and hydraulic survey
- Supervision of geotechnical surveys
- Geometrical design
- Structural design of containing structures
- Design of 2.1 Km of concrete pavement with reinforced joints with four lanes, two in each direction
- Design of the storm drainage and canal culverting of the stormwater discharges
- Design of the street lighting system
- Design of the traffic light signs, vertical signalings and horizontal demarcation of all the project area
- Monitoring of the project execution to solve occasional construction problems

Trump Ocean Club Panama

Location | Panama

Client | HSBC Bank USA, National Association

Dates | 2007-2012

Construction Amount | US$294 Millions

Contract Amount | US$789,424

Area | Building

Service | Construction supervision
Inspection services
Due Diligence private sector preinvestment

The Trump Ocean Club Panama is built on the Punta Pacifica Peninsula, it stands over 902 feet tall and contains more than 2.4 million square feet of building area. It is integrated by residential units and a wide variety of amenities. The construction of a building of that magnitude, never seen before in the region, required specialized design and construction knowledge and techniques. During this period, new architectural standards had to be defined as well as complex anti seismic requirements due to the structural geometry of the building.

WSP offered Independent Engineering Services in the Preparation and Construction phases. During the Preparation phase, WSP analyzed with the Development Team all aspects of the design, plans, drawings, estimates, costs and budgets, the permitting and planning work completed to date, water waste management, the possible risks, the environmental management and mitigation plans. For the Construction Phase, WSP worked with the developer to ensure timely construction with the highest quality and within acceptable costs.

As the Independent Engineer, WSP focused on monitoring activities during the construction period and on cash flow and funding during loan utilization. After the commencement of the works, the Independent Engineer provided services relative to the project construction contract.

Potable water for the cities of David, Chiriqui and Santiago de Veraguas

Location | Panama

Client | Inter-American Development Bank (IDB)

Dates | 10/2013-05/2014

Budget of Work | 30,000,000.00 USD

Budget of Contract | 750,000.00 USD

Field | Water and Sanitation

Service | Engineering Design
Procurement/ Bid Documents
Environmental Impact Assessment

The water systems of the targeted cities in this project were considered a great engineering challenge for WSP. In David, with 116.000 inhabitants and 32.000 homes, only the 48% of the population received water 24 hours in acceptable pressure conditions; the sewage system had a span of about 13%. Although the city of Santiago de Veraguas had a water service span of 98,4%, only the 85,9% of the supplied population had water 24 hours per day and the sewage span was about 36%.

The main goal of the consulting services was to develop the final studies and designs for the potable water works in the cities of David and Santiago de Veraguas, which were demanding rehabilitation investments and expansion of the system of about US$24 and up to US$6 million, respectively. These studies were made in the framework of an operation preparation "Multiphase Program of Potable Water and Sanitation Investments – Phase II" of the Inter-American Development Bank.

The consultancy main activities included, among others: Investigations on hydric resources, evaluation and diagnosis of the existing collection, transportation, treatment, distribution and storage infrastructures, economic and financing evaluation, final design of the improvement of the aqueduct networks in both cities and socio-environmental impact assessment of the aqueduct network improvements of the city of Santiago.

New water treatment plant of Bugaba

Location | Panama

Client | Instituto de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 06/2011-03/2012

Budget of Work | 32,000,000.00 USD

Budget of Contract | 250,229.00 USD

Field | Water and Sanitation

Service | Engineering design (Potable water treatment, Water transmission and storage system
Acquisition/Bid Documentation
Environmental Impact Assessment

WSP was selected by the National Environmental Authority IDAAN to perform a technical and economic feasibility study of the best option of comprehensive solution for the potable water supply to four communities in the District of Bugaba. The study included the definition of the design criteria and parameters, the basic studies and final designs, including final plans, costs and the tender documents of the following works:

- Location for a new site of the raw water intake and its corresponding design, including quality studies of the river Macho de Monte raw water at its intersection with the river Bregué.
- Design of the intake pipe to the plant site made of Ductile Iron of 30" of diameter with a capacity to carry 0.468 m3/s (1.07 mgd).
- Design of a new 10 MGD water treatment plant in conformity with the requirements of the quality of the drinking water set up in the COPANIT 395 norm and its respective technical regulations.
- Feasibility Study and Design for a potable water conduction pipeline from the plant to the communities of Bugaba, La Concepción, El Bongo and Sortová.
- Environmental Impact Assessment

The plant design included the following steps: Mix-coagulation, Hydraulic Flocculation, Accelerated sedimentation, Rapid filtration, Wash system (the filters washing was conceived to work without using back flushing pumps with minimal use of water.

Other design activities were: raw water intake, adduction and conduction pipeline, several adjacent buildings, water treatment, dosage systems, electrical, SCADA system, lighting, communication and telephone systems, pumping systems, contact and storage tanks, electrical power lines and transformers and storm drainage systems of the plant.

Potable water and sanitation in small and intermediate cities served by IDAAN

Location | Panama

Client | Instituto de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 10/2011-07/2012

Budget of Work | 170,723,328.00 USD

Budget of Contract | 1,111,109.00 USD

Field | Water and Sanitation

Service | Engineering Design (Potable and Waste Water Treatment, Water driving and storage system, Sewage system, Sewer pipes)
Acquisition/ Bidding Documents
Environmental Impact Assessment

WSP was selected by the National Environmental Authority (IDAAN) to perform a study to prioritize investments in water supply and sanitation in intermediate and small cities that included the feasibility studies and final design for the rehabilitation projects, improvement and expansion of the potable water conduction and distribution system in the districts of La Chorrera and Arraiján. In addition, this work strengthened IDAAN capacity to improve the investments planning having a portfolio of 15 studies and project designs of potable water and sanitation that could be funded through a future program of rehabilitation and widening of the existing infrastructure.

WSP developed its services in three stages:

- Design and implementation of a methodology to develop tools and selection criteria for the prioritization of the investments.
- Prioritization study of drinking water and sanitation investments, at pre-feasibility level, for 30 projects.
- Preparation of the feasibility studies and final designs, including plans, budgets and tender documents, for 15 prioritized projects and the improvement and expansion of the potable water conduction and distribution system in the Districts of La Chorrera and Arraiján.
- Execution of the corresponding Environmental Impact Assessments.

The work developed by WSP allowed access to potable water and sewage systems to an estimated 500,000 inhabitants, the construction of almost 100 km of pipes and the improvement of the operation and functioning of all systems in the beneficiary populations.

Extension and improvements of the sanitary sewer system of the city of Chitré and its surrounding areas, province of Herrera

Location | Panama

Client | Instituto de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 06/2007-02/2002

Budget of Work | 15,320,000 USD

Budget of Contract | 384,098.00 USD

Field | Water and Sanitation

Service | Engineering Design
(Waste water treatment plant, Sewage).
Environmental Impact study
Feasibility study

Chitre is the head district of Herrera Province, Panama, and comprises five "corregimientos". The sewer system of the city did not serve the best part of the population; in addition, the water from the existing sanitary sewer system flowed raw in a natural basin, with final destination the river Río La Villa, in and of itself very polluted.

WSP was selected to perform a feasibility study, which included identifying three collection and treatment options for the wastewater of the City of Chitre, Monagrillo and La Villa de Los Santos, including a new waste water plant of 6 MGD. In addition, WSP was responsible for the development of the final design and working drawings of the most recommendable collection and treatment option.

Water Supply System for the Communities Located Along the Panamerican Roadway in Darien

Location | Panama

Client | Sustainable Development Program of Darien

Dates | 01/2006-09/2006

Budget of works | 10,000,000 USD

Budget of Contract | 353,775.00 USD

Field | Water and Sanitation

Service | Engineering Design
Environmental Impact Assessment
Feasibility Study

In 1998, the Government of Panama and the Inter-American Development Bank (IDB) started a social program (Sustainable Development Program of Darien, PDSD) focused on a sustainable development of this marginal area, including development of several infrastructures, rural electrification, hospitals and water supply.

Along the Panamerican roadway, there are scattered communities whose existence is affected by the total lack of drinking water during the first months of the year (dry season). Preliminary studies had identified two water sources (the Chucunaque River and the Sabanas River) to supply the demand of these communities until the year 2020.

As part of this Program, WSP was engaged in 2006 to perform the feasibility study of an integrated system of these two water sources and the development of the intake, conduction, storage and distribution solutions with the most favorable technical, economic, social and environmental advantages. This was an incomparable work because of its multiple technical and social difficulties, including the difficulty of identifying reliable water sources and the challenge posed by a population too small to support a tariff-based system. The objectives of the study were:

- Update technical and economic studies advanced so far and assess their technical, economic, social and environmental viability.
- Identify, analyze and propose other alternatives if the former were not feasible.
- Perform detail design of the selected alternative, including the intake, conduction, storage and distribution works.
- Design two new plants of 1, 375,00 y 505,000 gallon/day in the cities of Villa Darien and Yaviza, respectively.
- Perform the EIA according to the requirements of the National Environmental Authority ANAM.
- Define operation of the system in order to minimize the operation costs.
- Prepare operation manuals and the institutional scheme to administrate the integrated system.
- Evaluate existing distribution networks and prepare a plan to incorporate or adequate them to the new system.

Potable water for the Panamerican roadway communities: Arimae – Yaviza, province of Darien

Location |	Panama
Client |	Sustainable Development Program of Darien
Dates |	05/2008-10/2012
Budget of Work |	11,910,533.54
Budget of Contract |	988,522.00 USD
Field |	Water and Sanitation
Service |	Construction supervision/ Inspection Services Costs Estimates

In may 2008, WSP was again contracted by the Program, under the management of the National Council for Sustainable Development, CONADES , to provide inspection and supervision services for the construction of the water supply system for the communities located along the Darien Roadway. The project, financed by the IDB, comprises two independent solutions: a water supply system and treatment plant in Villa Darién and water supply system and treatment plant in Yaviza.

El project consisted of the construction of the complete water supply system, involving two intakes into the Chucunaque River and two associated pumping stations, conduction lines, two water treatment plants (in Villa Darién and Yaviza), 15 storage tanks in various communities along the road, 6 booster stations, more than 100 kilometers of pipeline, micro-metering, and electrical power line extensions.

WSP services included verification of benchmarks, quality control and material testing, work progress assessment, verification and approval of quantity surveys for payment, report preparation, analysis and recommendation of alternatives, time and cost estimates to completion, and final reception of the works.

Design of 54" & 30" diameter reinforced pipelines from Tinajitas to the exit in Martin Sosa

Location | Panama

Client | Instituo de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 09/2011-09/2012

Budget of Work | 32,590,625.30

Budget of Contract | 261,682.00 USD

Field | Water and Sanitation

Service | Engineering Design
Environmental Impact Assessment
Feastibility Study

The National Environmental Authority (IDAAN), as part of the Water Supply Master Plan for Panama City, defined as a priority a potable water pipeline to reinforce the distribution of water in the Western side of the city (identified as the Western Water Pipeline). The potential construction of an important development of government hospitals and health care centers (the Hospital City) and a complex to keep the food cold chain, urgently required the immediate installation of approximately 5.5 km of a 54" pipeline, and 1.5 km of 30", for which IDAAN hired WSP services.

The project tasks included, among others, the following:

- Best alignment selection.
- Topographic Survey and Geotechnical investigation
- Water Demand Estimates
- Hydraulic Modeling using Watercad
- Review diameters and select pipeline materials.
- Define fittings, deflections and structures of the pipeline.
- Prepare plans/profiles and detailed drawings for construction.
- Prepare Costs Estimates and Specifications.
- Environmental Impact Assessment.

The study was satisfactorily completed in a four months period, allowing IDAAN get into the construction phase according to the official plan.

Design, construction and operation of Water Supply Works - Group 2

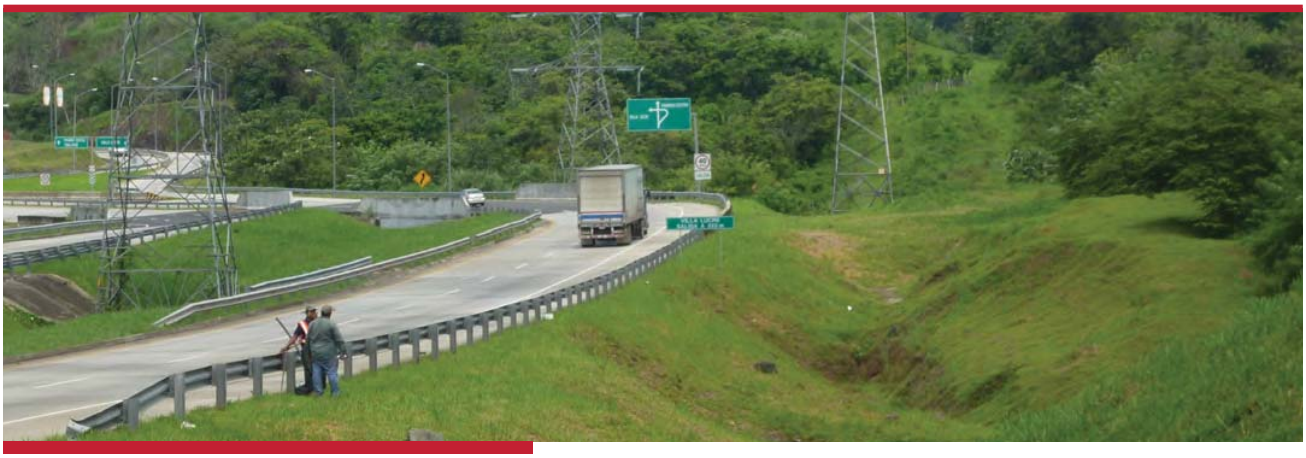
Location |	Panama
Client |	Construtora Norberto Odebrecht S.A.
Dates |	11/2012-07/2014
Budget of Works |	158,000,000.00 USD
Budget of Contract |	2,367,694.00 USD
Field |	Water and Sanitation
Service |	Engineering Design Land Surveying/Cadastre Technical Assistance and Consulting Services

The local Aqueducts and Sewers institution (IDAAN), as part of an Investment Plan for Water Supply of the city of Panama, defined as priority a series of pipelines to complete the city's hydraulic ring. These works are composed of a number of mains of which Group 2 is part; it is engaged by the National Board of Sustainable Development (CONADES). The works included in Group 2 include a 4MGD tank at María Henríquez, Maria Henriquez Line to Gonzalillo (30", 10km), la Línea de Oriente 2 (14km en 36 y 42") East Line No 2 (36 and 42" 14km) and improvement to the networks of San Miguelito and Pedregal.

WSP was hired by Constructora Norberto Odebrecht SA (CNO), successful bidder, to perform final designs and technical assistance on the above mentioned group of works.

Contracted services included baseline studies, final designs of all works under the Group 2 Works, including hydraulic analysis and detailed designs of the project components, the relocation of utilities and support for the approval of plans and assistance to CNO in the construction of the works.

Optimization projects of potable water systems in Panama and main urban centers in the country



Location | Panama

Client | Instituo de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 03/1994-03/1995

Budget of Works | 150,000,000.00

Budget of Contract | 2,008,400.00 USD

Field | Water and Sanitation

Service | Engineering Design
Environmental Impact Assessment
Feasibility Study

The objective of the optimization study of water resource systems for the City of Panama and three other main urban centers in the country (Arrijan, La Chorrera and Colon) was to develop a detailed study of the economic and financial mechanisms for the IDAAN management, with the purpose of designing a plan of action whose ultimate goal is a self-sufficient entity. Moreover, feasibility studies of potential solutions at the infrastructure level were developed with their corresponding prioritization, including the components related to the water production and the control of non-revenue water.

Main aspects of the study included:

- A detailed and comprehensive study of demand and hydraulic characteristics of systems of supply, storage and water distribution for the city of Panama, the metropolitan area of Arraijan, and the cities of Colon and La Chorrera with their respective suburban areas.
- The technical feasibility, socio-economic and financial studies, in addition to an environmental impact study, for the optimization projects required by IDAAN in order to accomplish its mid-term challenges.
- Evaluation and analysis of middle and marginal costs. The development of a Tariff Plan and its method of implementation.
- Final design and specifications to execute the projects selected for the widening of the water resource system, as part of a 20 years Master Plan.
- Identification of all non-structural actions needed to minimize the volume of water not accounted in the studied urban centers.

Institutional Strengthening of IDAAN based in Water Supply Network Optimization in Panama City

Location | Panama

Client | Ministry of Health - Unidad Coordinadora del Proyecto de Saneamiento de la Ciudad y Bahía de Panamá

Dates | 07/2008-09/2010

Budget of Works | 200,000,000.00 USD

Budget of Contract | 2,695,039.00 USD

Field | Water and Sanitation

Service | Engineering Design
Faisability Study
Public Sector Pre-investment
Master Plans
Technical Assistance and Consulting Services

Panama City, Arraijan and La Chorrera are growing fast. Utilities are requiring constant revision and updates in their infrastructure and operation. In this sense, and as a consequence of the previous project, WSP was contracted to support Panamanian Water and Sewage Institute with the following services:

- Global Audits in Technical, Commercial, and Organizational Aspects of IDAAN countrywide, including physical planning, studies and designs, potable water production and quality, commercial management, operation and maintenance, construction supervision, and human resources management.
- Review of Legal Issues Related with Contracts of IDAAN in Former Canal Zone.
- Customers' Survey Including approximately 77,000 Connections.
- Evaluation of macro metering and invoicing of the water supplied by Panama Canal Authority to IDAAN.
- Survey of Water Supply and Wastewater Networks in Reverted Areas.
- Hydraulic Modeling of the potable water supply network of Panama City with more than 1.5 million inhabitants; from the modeling, the problems of the system in the current and future situation were determined and the required works were defined to be improved. This lead lately to the hydraulic ring works (Groups of Works 1, 2 and 3).
- Implementation of Hydraulic Sectors including valves and macrometer installation, also from the results of the hydraulic modeling.
- Leak Reduction Program detecting and fixing leaks for Panama City.
- Recommendations for the widening and improvement of the Plant of Chilibre.
- Master Plan of Investments for the period 2010 - 2015.

Technical assistance for IDAAN investment projects with multilateral agencies

Location | Panama

Client | Instituo de Acueductos y Alcantarillados Nacionales (IDAAN)

Dates | 10/2012-09/2014

Budget of Works | 230,000,000.00 USD

Budget of Contract | 1,623,458.00 USD

Field | Water and Sanitation

Service | Institutional Strengthening
Program Management/ Construction Management
Technical Assistance and consulting services
Training and Technology Transfer

As part of its Master Plan for enhancing investment and sustainable improvement of Water Supply and Sewerage Systems of Panama, the national water agency IDAAN selected WSP to implement activities and collaboration with technical assistance and support their Projects Unit in order to provide the necessary technical elements for decision-making associated with the implementation of projects within investment programs financed by the multilateral agencies.

WSP developed the following main activities:

- Establish the technical basis for design and execution of works of the various investment projects of each loan.
- Prepare tender documents and support the award of contracts for the works execution.
- Support IDAAN for proper planning, programming, and execution of investments.
- Track of the monitoring programs of the quality of works.
- Establish an environmental and social strategy for the implementation of projects.
- Install and implement an Operational Control Unit of the infrastructure networks in the metropolitan area of Panama, including the training of personnel involved.
- Provide the necessary equipment, and identify short-term investments, to reduce water losses.
- Execute spreading and information activities and works about the progress of the contracts, exhibitions, presentations, etc.
- Coordinate various activities for compliance with each loan program.
- Provide comprehensive management of the project as a whole, through the Project Web Server software tool.
- Provide training in contract administration, operation of water distribution systems and environmental aspects of project development of potable water supply.
- Recommendations for the prioritization of hydraulic sectors and implementation of practices of monitoring and reduction of non-revenue water.