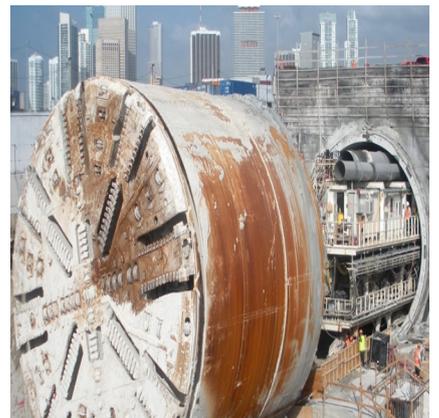


LANGAN INTERNATIONAL INFRASTRUCTURE QUALIFICATIONS



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RION-ANTIRION BRIDGE

Location: Corinthian Straits, Greece
Client: Gefyra S.A., Bank of America, Bank of Tokyo-Mitsubishi (UK) Ltd.
Services: Geotechnical, Site/Civil, Environmental

OVERVIEW

Langan International served as the Lender's Technical Advisor for this ?1 billion multi-span cable stayed bridge spanning the Gulf of Corinth in Greece. It consists of a 3.2 kilometer long deck constructed in an area of deep sea waters (65 m+), marginal soils and high seismicity. Construction involved dry docks, wet docks, deep dredging, underwater high-voltage cable relocation, soil improvement, tension leg barges, and off-shore techniques for the float-out and final positioning of the 90-meter diameter pylon bases.

AWARDS

- 2014 International Federation of Consulting Engineers Award of Merit
- 2007 Deep Foundation Institute Outstanding Project Award
- 2006 International Association for Bridge and Structural Engineering Award for Outstanding Structure
- 2005 American Society of Civil Engineers Outstanding Civil Engineering Achievement Award
- 2005 American Council of Engineering Companies New York Diamond Award
- 2005 American Council of Engineering Companies National Grand Award

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ELEFSINA-KORINTHOS-PATRAS-PYRGOS-TSAKONA (EKPPT) MOTORWAY

Location: Peloponnese, Greece
Client: VINCI S.A., HOCHTIEF, J&P-ETETH
Services: Geotechnical, Site/Civil, Environmental, Natural Resources & Permitting

OVERVIEW

Langan is serving as technical advisor to the lenders (LTA) for the design, construction, financing, operation, maintenance and exploitation of the EKPPT motorway in Greece. The motorway will link Athens and Korinthos to the western end of the Peloponnese, including the Rion-Antirion Bridge, and significantly improve the safety of the existing road between Korinthos and Patra.

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CHACAO BRIDGE

Location: Chacao Channel, Chile
Client: Consortium of HOCHTIEF, VINCI and American Bridge
Partner: Ammann & Whitney
Services: Geotechnical, Earthquake/Seismic

OVERVIEW

Langan served as an Independent Engineer to provide design checking on the team of Ammann & Whitney/Flint & Neill for this 2.5 km long suspension bridge Concession Project reporting to concessionaire; currently underway. The suspended bridge was planned to link the island of Chiloé with continental Chile through the Chacao Channel. If completed, it will be the largest suspension bridge in South America.

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MANZANILLO INTERNATIONAL TERMINAL

Location: Colon, Panama
Client: Stevedoring Services of America
Services: Geotechnical

OVERVIEW

The new construction required dredging of the adjacent bay for ship movements. In addition, a new 16-hectare container storage area was created within the existing bay. Deep foundation support of this area was not economically feasible. Consequently, a vertical wick drain system combined with fill surcharging was used to accelerate settlements to allow for near future construction while minimizing post-construction settlements.

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PORTMIAMI TUNNEL

Location: Miami, FL
Client: Florida Department of Transportation, City of Miami, Florida,
Miami Access Tunnel Concessionaire
Partner: Bouygues Civil Works Florida,
Services: Geotechnical
Lead Designer: Jacobs Engineering Group

OVERVIEW

This project is the first large-diameter tunnel constructed in Florida's challenging soft sedimentary geology using a tunnel boring machine (TBM). The purpose of the PortMiami Tunnel is to relieve traffic congestion in downtown Miami by diverting car, truck, and bus traffic from nearby highways directly to the Port of Miami through twin 42-foot diameter tubes extending below the main ship channel. Langan evaluated the subsurface data to develop the geotechnical engineering parameters required for design of the bored tunnel and the TBM. Langan also observed and monitored early-phase testing consisting of foundation load testing and Cutter Soil Mixing for the U-wall and cut-and-cover portions of the project.

AWARDS

American Council of Engineering Companies Engineering Excellence Awards
Florida Engineering Society

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Credit: "NYNJ Link Partnership"

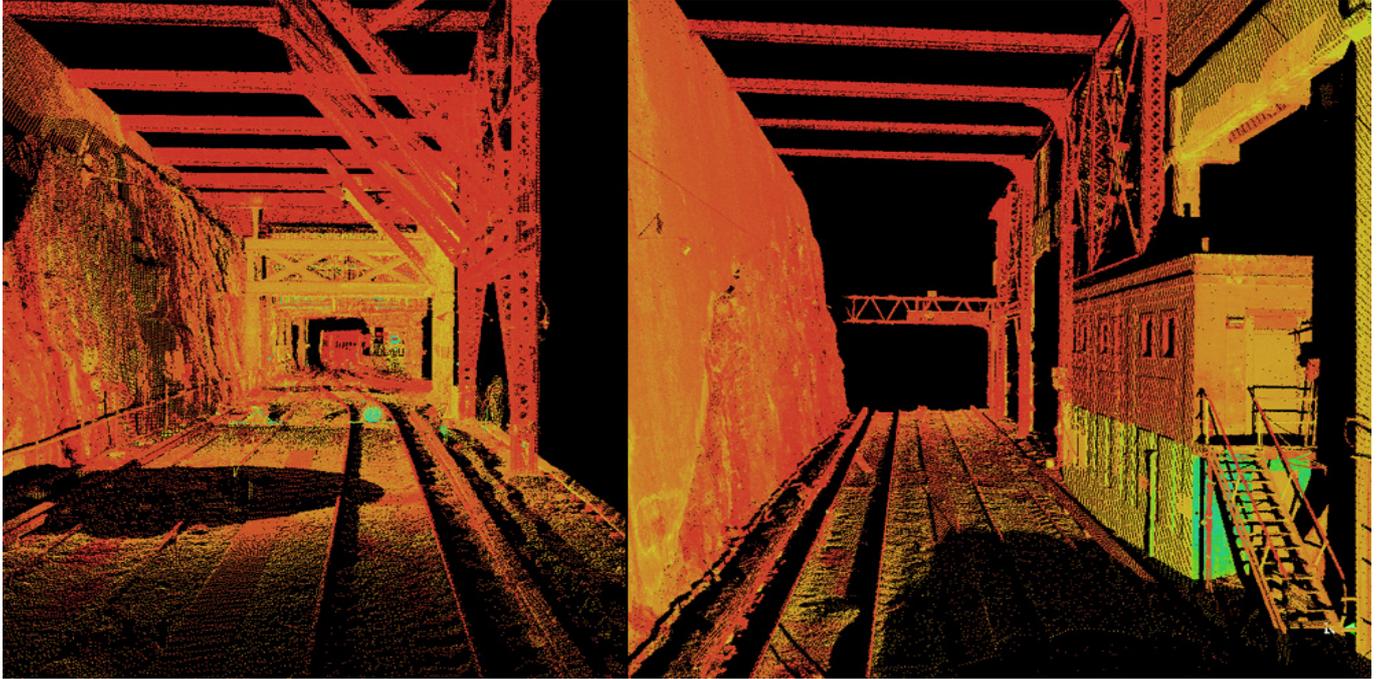
GOETHALS BRIDGE REPLACEMENT

- Location: Elizabeth, NJ / Staten Island, NY
Client: Parsons Transportation Group, Kiewit-Weeks-Massman, AJV
Partner: The Port Authority of New York and New Jersey
Services: Natural Resources & Permitting, Geotechnical, Site/Civil

OVERVIEW

Langan was the lead designer of a temporary access road that was required to provide a stable working platform to construct the new bridge. As the †Permitting Specialist† for the design phase of the project, Langan addressed a wide range of environmental management and permitting requirements. Engineering and environmental responsibilities included preparation of a draft Environmental Management Plan, wetland impact analysis for concept road plans, draft permit condition compliance reporting submissions, prepared permit modification packages for wetland permitting, and prepared new permit applications required for construction dewatering activities for New Jersey and New York.

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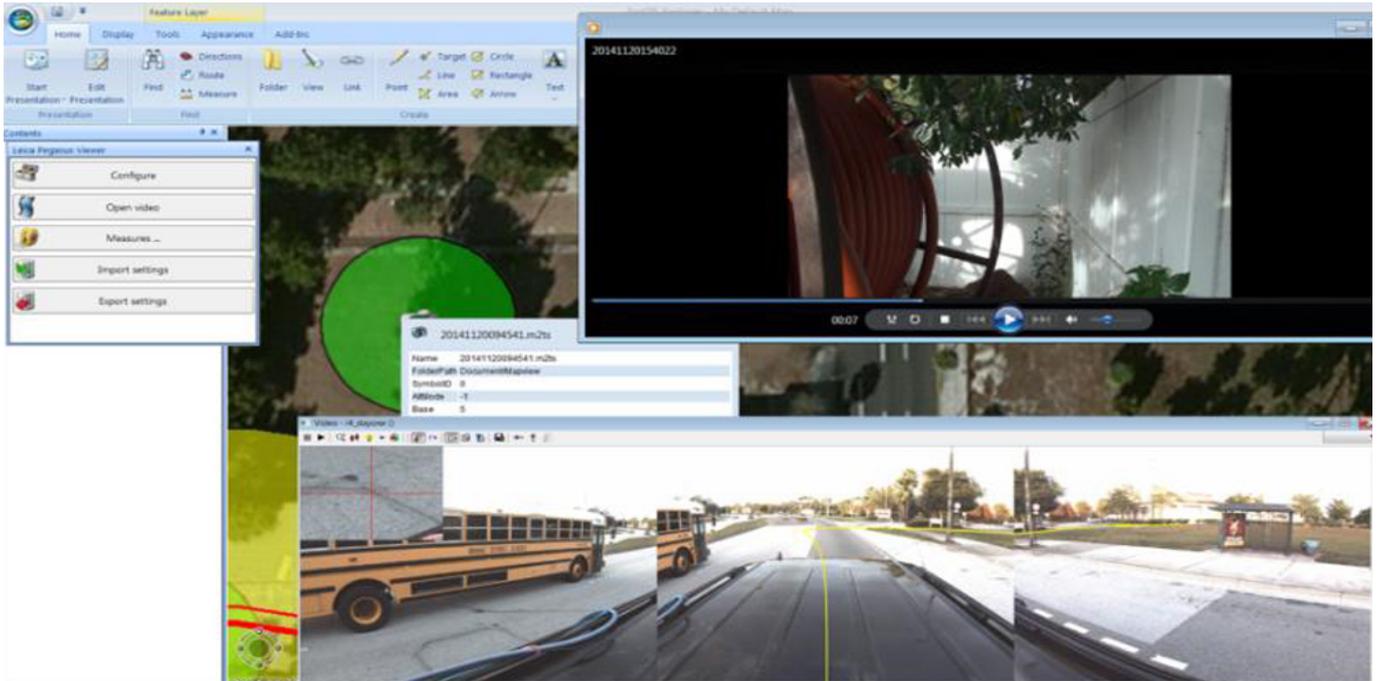
PENN STATION REDEVELOPMENT

Location: New York, NY
Client: Moynihan Station Development Corporation
Services: Terrestrial Scanning/BIM, Traditional Surveying

OVERVIEW

As the surveyor of record for this major redevelopment, Langan used both standard survey techniques and 3D laser scanning to provide detailed and highly accurate mapping of the rail system and its associated facilities and structures without the need for extensive rail closures and without placing surveyors in harm's way of the track system. The 3D model that was created also allowed the team to review site details without having to return to the site.

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ULTIMATE I-4 EXPANSION

Location: Orlando, FL
Client: Skanska/Granite Lane Joint Venture (SGL)
Services: Mobile Mapping/UAS Mapping

OVERVIEW

Langan provided mobile mapping, video logging, field video capture, and geospatial data integration services in support of the major expansion of a 21-mile stretch of U.S. I-4, which includes the addition of four new express lanes, and reconstructed interchanges and bridges.

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GOLDEN GATE BRIDGE, NORTH APPROACH VIADUCT SEISMIC RETROFIT

Location: San Francisco, CA
Client: Balfour Beatty Construction
Services: Geotechnical

OVERVIEW

Langan provided geotechnical services during the seismic retrofit of the north approach viaduct of the Golden Gate Bridge. The retrofit included replacing the four steel towers, which supported the approximately 1000-foot-long, six-lane-wide north viaduct approach.

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UNION STATION - CAPITAL IMPROVEMENTS

Location: Washington, DC
Client: Burns Engineering, Inc., Amtrak
Services: Site/Civil, Geotechnical, Traditional Surveying, Terrestrial Scanning/BIM

OVERVIEW

Langan was retained to perform multiple services at this busy landmark Amtrak facility for future proposed improvements including a mixed-use overbuild project, below-grade parking, and track service improvements. Langan performed a boundary, topographic, and utility survey to facilitate the design and permitting of site demolition work; and construction of a substation, parking lot improvements, and several new catenary structures. Langan also performed a 3D laser scan of the Amtrak rail lines and surrounding parcel features from an adjacent lot, as well as geotechnical and civil engineering services to support the permitting and construction of the improvements.

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CHALMETTE LOOP LEVEE - BAYOU BIENVENUE TO BAYOU DUPRE REACH LPV 145

Location: St. Bernard Parish, New Orleans, LA
Client: Chalmette Levee Constructors (Kiewit/Massman/Traylor JV)
Partner: US Army Corps of Engineers
Services: Geotechnical

OVERVIEW

The Chalmette Loop Levee is a primary flood protection component of the Army Corps of Engineer's mission to protect the City of New Orleans. The Bayou Bienvenue to Bayou Dupre Reach LPV 145 is a 6-mile stretch of levee flood protection improvement adjacent to the Mississippi River Gulf Outlet waterway. The improvement consists of a 10- to 14-foot reinforced concrete T-wall to be constructed atop the existing levee to improve the flood protection to a 100-year event. Langan's role included pile foundation and subgrade stabilization design, constructability reviews, temporary bridge structural foundation design, and value engineering.

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VTA PARKING STRUCTURES - MILPITAS & BERRYESSA STATIONS

Location: Milpitas, CA
Client: Santa Clara Valley Transportation Authority
Services: Geotechnical

OVERVIEW

Langan is providing geotechnical engineering services for two parking structures at Milpitas and Berryessa stations. The two individual projects each include the construction of a 1,200-space, 432,500 GSF structure constructed with cast-in-place, post-tensioned concrete beams and slabs. The Milpitas Station parking structure will be a 6-level at-grade structure. The Berryessa Station parking structure will be a 3-7 level at-grade structure. Both sites are underlain by clay with interbedded layers of sand.

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