Governor Harry W. Nice/Senator Thomas "Mac" Middleton Bridge Replacement

Newburg, MD - Dahlgren, VA

CATEGORY C - STRUCTURAL SYSTEMS

Graceful in form, useful in function, the new Governor Harry W. Nice/Senator Thomas "Mac" Middleton Bridge is vital to Maryland's transportation network. Debuting almost three months ahead of schedule, the sleek new crossing gradually ascends from the Maryland shore, rising 135 feet above the Potomac River to allow passage of tall vessels before dropping down to just above the water as it connects with Virginia.

The new bridge doubles the vehicle-carrying capacity of its 1940 predecessor – four 12-foot-wide lanes replace two 11-foot lanes – greatly reducing congestion during high-travel periods and enabling first responders to rapidly provide emergency care and clear incidents when they occur. Important for safety, a barrier-separated median between north- and southbound traffic will prevent head-on collisions, a significant hazard and chronic source of anxiety for generations of drivers crossing the narrow old bridge. All-electronic tolling already has eliminated queuing that previously extended back from cash-collecting toll booths. The new bridge safely accommodates cyclists with intelligent transportation systems and bicycle safe joints.

Construction of the 1.9-mile bridge began in July 2020 and culminated in October 2022. After traffic was transferred onto the new bridge, demolition of the old crossing began. Under the Maryland Transportation Authority's supervision, the $463 million design-build project was constructed by a joint venture of Skanska, Corman and McLean, and designed by AECOM.

The new four-lane Nice-Middleton Bridge replaced the existing 1.9-mile long, two-lane bridge that originally opened in 1940.

Designed and permitted in 11 months, construction started four months early in 2020 and continued during the COVID –19 pandemic.

Skanska -Corman-McLean brought together the largest construction marine fleet in the East Coast to concurrently build 200-ft long deep foundations; 135-ft tall piers; 95" deep and 175-ft long concrete girder spans; and 12-ft deep and 350-ft long steel spans.

Sustainability at its Best: Using recycled concrete from the demolition of the original bridge, artificial reefs were built to create fish habitat.

The innovative bridge design incorporated efficient and cost-effective span lengths that took into account: repetitive and fast construction techniques; simplified future maintenance inspection details; and minimized total cost of ownership for the 100-year service life.

Designed for 100 years, the bridge was opened to traffic on October 12, 2022 – almost three months ahead of schedule!

Owner:
Maryland Transportation Authority
2310 Broening Highway
Baltimore, MD 21224

Entering Firm:
AECOM
4 North Park Drive, Suite 300
Hunt Valley, MD 21030

ACEC Engineering Excellence Awards

AECOM

MTA Grand Central Madison (formerly known as East Side Access)

New York, NY • Category H: Transportation

Grand Central Madison (GCM), formerly known as East Side Access, is the Metropolitan Transportation Authority's largest capital project. The GCM terminal and rail service brings Long Island Rail Road trains to Manhattan's East Side. Project components included installing 40-miles of new tracks, constructing a new terminal beneath Grand Central, extensive excavations and modernizing Harold Interlocking. The project saw more than 8 miles of tunnels excavated between Manhattan and Queens, over 1 million cubic yards of concrete poured, complex rail system installations and reconfiguration of Harold Interlocking while maintaining active service. The new connections in eastern Queens increase capacity in and out of Manhattan by almost 50 percent. With a one-seat ride to and from Manhattan, shorter commute times and enhanced economic development opportunities, GCM and its expanded transit service is life-changing for people in the region.

photos courtesy of NY State

Completed station, lower platforms. The station and tail tracks allow for idling of up to 12 trains at a time. At 140-feet below Park Avenue, the caverns are the project's deepest excavations.

Completed station, mezzanine level. The station mezzanine levels allow for passenger flow between the two station caverns and up to the concourse level.

Station cavern excavation. Situated approximately 140-feet below Park Avenue, one of the two approximately 1,200-foot-long, three-level caverns that were created using tunnel boring machines, road headers and drill-blast excavations. Completion required more than 3,000 blasts.

Station cavern structure construction. The two three-level structures were built using 4,000 individual precast members. Each completed cavern contains four trains, two center platforms and a mezzanine level for passenger access.

Completed GCM Concourse. GCM's 350,000-square-foot passenger concourse includes design features that complement one of the world's most iconic public transit spaces. The new GCM station included constructing 47 escalators, 22 elevators, new ventilation facilities, over 275,000 square feet of passenger space and 25,000 square feet of retail space.

Grand Central Madison provides Long Island Rail Road passengers with a one-seat ride to Manhattan's East Side while also allowing for LIRR service redundancy between Queens and Manhattan.

ACEC Engineering Excellence Awards

MTA Grand Central Madison (formerly known as East Side Access)

Client's Name:
MTA Construction and Development

Entrant's Name:
AECOM
New York, New York

New York Penn Station LIRR Train Hall Renovation Phase 2 – Concourse Improvements

Manhattan, New York

Category C: Structural Systems

Delivering an expanded concourse in the country's busiest train station

As a major transportation hub serving the Long Island Rail Road (LIRR), NJ TRANSIT, and Amtrak, with direct connections to six New York City Transit subway lines, Penn Station hosted approximately 600,000 visitors daily pre-pandemic. With expanding rail services across the New York region, its LIRR Concourse had become unable to meet present and future projected commuter demand.

Now, newly renovated, the LIRR Concourse has doubled in width, and the ceiling height was raised to 18 feet.

The lead designer provided structural, mechanical, electrical and fire alarm, plumbing and fire protection, vertical transportation, civil and utility, architectural, passenger circulation, acoustical, communications and security designs in addition to overall design management. Working as a team with the contractor, and in close collaboration with MTA Construction & Development and other partners and stakeholders enabled delivery of the project on time and within budget while maintaining operations in the busiest transportation facility in the western hemisphere.

LIRR Concourse prior to construction of East End Gateway in Phase 1 and the concourse expansion in Phase 2. The LIRR Concourse was doubled in width, dramatically reducing pedestrian congestion in heavily trafficked areas of Penn Station, adding over 15,000-square-feet of circulation capacity and facilitating future growth in transit use in the New York region.

Removing the 'Head-Knockers', raised the LIRR Concourse ceiling height from less than 7 feet in some areas to 18 feet. Implementing an innovative structural framing system improved sightlines for intuitive wayfinding, easing passenger navigation through the Penn Station complex. All of this was achieved while maintaining 24/7 operations in the busiest transportation facility in the western hemisphere.

The renovated LIRR Concourse modernizes Penn Station's functionality, building on the new East End Gateway entrance and restored Moynihan Train Hall across Eighth Avenue. In the LIRR Train Hall, over 360 color-changing LED ceiling panels create a luminous glow, complementing the daylight streaming in through the glazed entrance canopy.

Several platform staircases were reconstructed including new fire-rated stair enclosures. These improvements bring the stairs into a state of good repair, provide separation between the trainshed and the concourse, offer enhanced lighting, and add intuitive wayfinding elements.

Accessibility was improved by adding a new ADA compliant elevator connecting the station concourse to street level that is nearly twice as large as standard transit elevators. Four other elevators were replaced in the station providing more reliable service. This entrance incorporates a new mosaic artwork installation.

The LIRR Concourse improvements include new wayfinding signage; distributed train information displays, newly replaced ADA elevators, modern LED lighting and updated HVAC with increased outdoor air flow. These amenities enhance the customer experience and provide the ability to accommodate a projected future commuter demand of more than 800,000 daily passengers.

ACEC Engineering Excellence Awards

New York Penn Station LIRR Train Hall Renovation Phase 2 – Concourse Improvements
Manhattan, New York

Client's Name:
MTA Construction & Development

Entrant's Name:
AECOM
New Jersey

ACEC ENGINEERING Excellence AWARDS

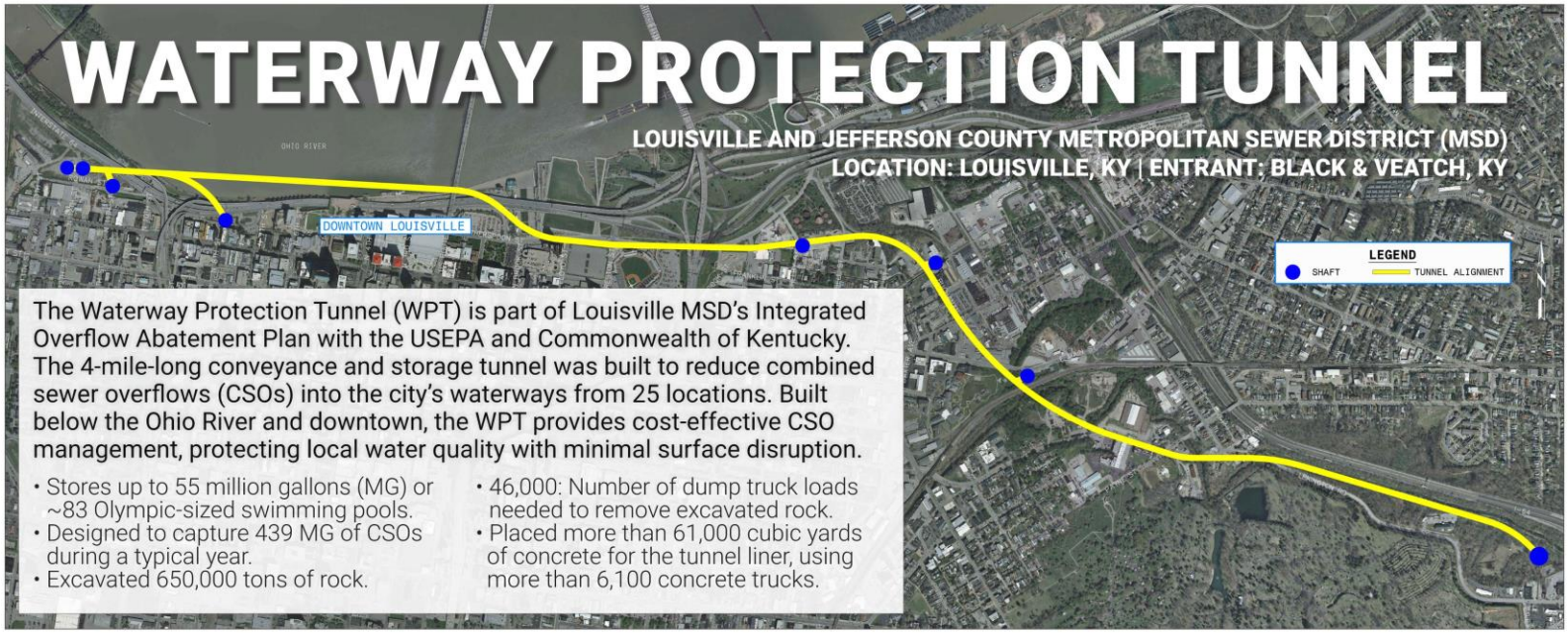
Out of Sight, Peace of Mind
The choice to replace planned surface-level CSO storage basins with a 20-foot diameter tunnel bored through the bedrock 200 feet below downtown Louisville minimized construction and long-term impacts to highways, utilities and other infrastructure as well as to residents and businesses.

State-of-the-Art Conveyor System
Excavated rock was removed via an 8-mile-long continuous horizontal conveyor system within the tunnel then via a vertical conveyor within the launch shaft reaching 200 feet below ground before it was piled at the surface to be hauled off site.

Safety Performance
Despite its magnitude, complexity, and duration, the project was completed with no serious injuries and no public safety incidents. Work was carried on throughout the COVID pandemic while helping the city meet the USEPA's regulatory requirements.

WATERWAY PROTECTION TUNNEL

LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD)
LOCATION: LOUISVILLE, KY | ENTRANT: BLACK & VEATCH, KY

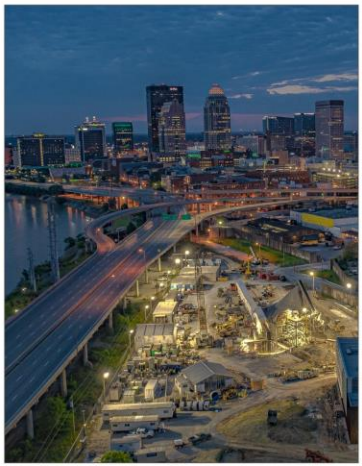


The Waterway Protection Tunnel (WPT) is part of Louisville MSD's Integrated Overflow Abatement Plan with the USEPA and Commonwealth of Kentucky. The 4-mile-long conveyance and storage tunnel was built to reduce combined sewer overflows (CSOs) into the city's waterways from 25 locations. Built below the Ohio River and downtown, the WPT provides cost-effective CSO management, protecting local water quality with minimal surface disruption.

- Stores up to 55 million gallons (MG) or ~83 Olympic-sized swimming pools.
- Designed to capture 439 MG of CSOs during a typical year.
- Excavated 650,000 tons of rock.
- 46,000: Number of dump truck loads needed to remove excavated rock.
- Placed more than 61,000 cubic yards of concrete for the tunnel liner, using more than 6,100 concrete trucks.

Cast-in-Place Concrete Tunnel Liner
Collapsible steel forms, which were used to place a 12-inch thick concrete liner, were repeatedly leap-frogged by moving form sections on railway tracks through the center of the 216-feet-long form-work assembly. Concrete was pumped from the ground surface at 7 different locations vertically down 200 feet and laterally within the tunnel up to distances of 3,300 feet.

45-Feet Wide Wye, 200 Feet Below Ground
To avoid drill and blast excavation within the I-64 corridor (see aerial, right), the 420-foot tunnel boring machine (TBM) was reversed from the tunnel on the right via an innovative method to create a wye junction, after which it resumed excavation of the mainline tunnel on, left. Going in reverse with only the gauge cutters removed, the TBM had mere inches of wiggle room.



Community-Enhancing, Cost-Saving Benefits
- Eliminated 4 near-surface CSO storage basins.
- 100+ year project life expectancy with minimal rehabilitation needs.
- Consolidated 4 pump stations into 1.
- Minimized community impacts, preserving property values.
- In its first 16 months of operation, the system captured more than 500 million gallons of CSOs.
- Stakeholder engagement built support and trust.

BLACK & VEATCH

EchoWater Project

ACEC Engineering Excellence Awards

Brown and Caldwell

HDR

Nitrifying Sidestream Treatment

Biological Nutrient Removal System Blowers

In 2010, the Sacramento Area Sewer District (SacSewer) received new treatment requirements to be implemented by 2021 and 2023. This required an upgrade to their 181-million-gallon-per-day treatment facility to discharge cleaner water to the Sacramento River and produce water suitable for ag irrigation resulting in in-lieu groundwater recharge.

The $1.7 billion program was branded "EchoWater" to reflect wastewater's return to a clean, natural state — much like an "echo" returning to its source. The largest public works project in Sacramento history, the EchoWater Project is the country's first to implement 4D and 5D software, linking design models to cost-loaded schedules during planning and construction. The Nitrifying Sidestream Treatment facility converts ammonia to reduce chemical costs for odor control by $10,000 per day. Meanwhile, its Biological Nutrient Removal process, one of the largest in the country, removes 99% of the ammonia and 89% of the nitrogen from the wastewater. Finally, the Tertiary Treatment Facility removes smaller particles and larger quantities of bacteria and viruses from the effluent when compared to secondary treatment.

With the $2.1 billion cost expected to triple customer rates, the team's efficient process, value-oriented planning, successful pilot program and methodical construction management, the project wrapped up for $1.7 billion.

Delivered under original budget projections and on schedule, the EchoWater Project resulted in cleaner discharge to the Sacramento River, provides recycled water for unrestricted beneficial reuse, keeps SacSewer in compliance with regulatory permits, implemented once-in-a-lifetime technology breakthroughs and overcame exceptional challenges.

Title: EchoWater Project
Sacramento, California

Entrant: Brown and Caldwell/
HDR Joint Venture | Sacramento, California

Client: Sacramento Area Sewer District
Sacramento, California

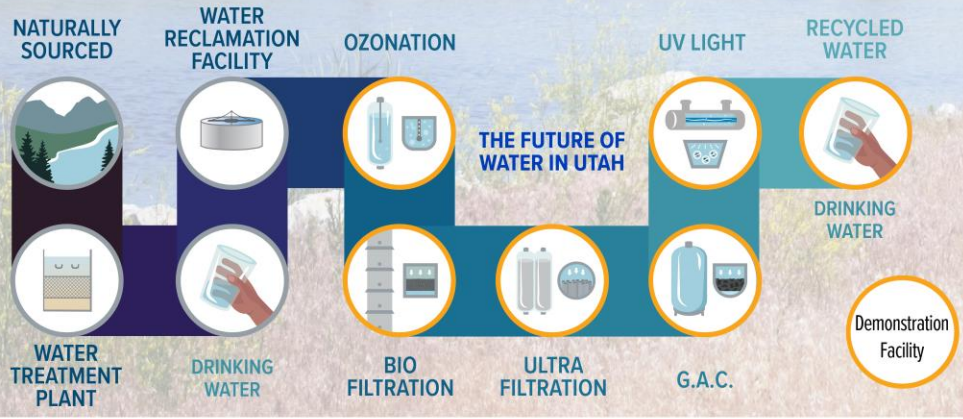
ACEC ENGINEERING Excellence AWARDS

PURE SOJO DIRECT POTABLE REUSE DEMONSTRATION FACILITY

CITY OF SOUTH JORDAN, SOUTH JORDAN, UT
CAROLLO ENGINEERS, INC., SALT LAKE CITY, UT

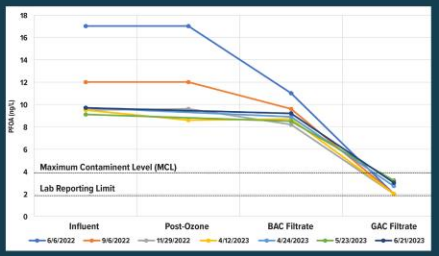
This advanced water treatment demonstration facility is paving the way for creating new, drought-tolerant, local water supplies in Utah and across the US.

The process train creates safe drinking water from treated waste water without relying on the expensive reverse osmosis and its associated brine disposal.



Demonstration Project Goals

- Prove the technology for purifying recycled water for future water supply.
- Educate the community on the opportunities and benefits of recycling water.
- Work with state officials to forge a path for water recycling regulations for the future.



The Pure SoJo carbon-based advanced treatment (CBAT) train has successfully removed an array of regulated and unregulated containments, included Perfluorooctanoic Acid (PFOA).

Taste testing events at the Pure SoJo demonstration pilot will be open to the public to help educate communities on potable reuse, allowing individuals to taste the water first-hand.

Collaboration with state regulators is leading to new potable reuse regulations, putting communities one step closer to another source of much needed water.

IN PARTNERSHIP WITH:

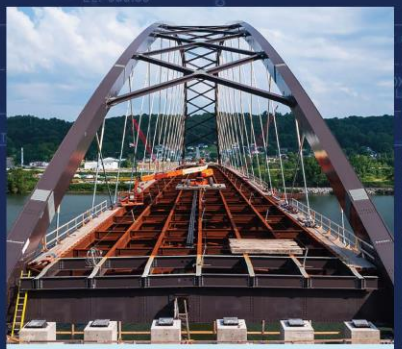
carollo
SOUTH JORDAN UTAH
UTAH DEPARTMENT of ENVIRONMENTAL QUALITY DRINKING WATER
THE UNIVERSITY OF UTAH
THE Water Research FOUNDATION
NWRI NATIONAL WATER RESEARCH INSTITUTE
SOUTH VALLEY SEWER DISTRICT
STATE U

Wellsburg Bridge - New Ohio River Crossing

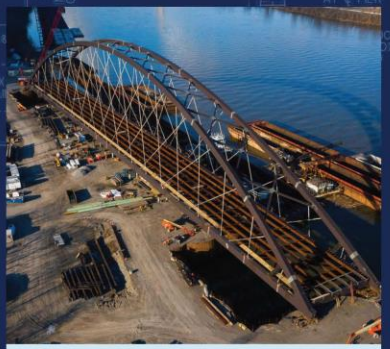
Providing a Vital Connection Between Wellsburg, West Virginia and Brilliant, Ohio

The bridge carries three lanes of traffic and a multi-use trail. The steel arch rib geometry is radial, as opposed to the traditional parabolic curve, which provides a lower rise and more efficient shape when combined with a network cable arrangement. The 830-foot main span was lifted onto two pairs of barges and moved into position in a massive 13-and-a-half-hour operation. It was the largest bridge float-in project performed in North America. The bridge was supported on the barges by eight sets of mega-jack towers and slowly jacked up until it was high enough to rest on the concrete piers.

The Wellsburg Bridge, which is West Virginia's first alternative delivery project, will reduce travel time between Wellsburg and Brilliant, stimulate economic development in the area, provide a new river crossing for commerce, and offer an alternative route across the river if maintenance work needs to be done on nearby bridges.



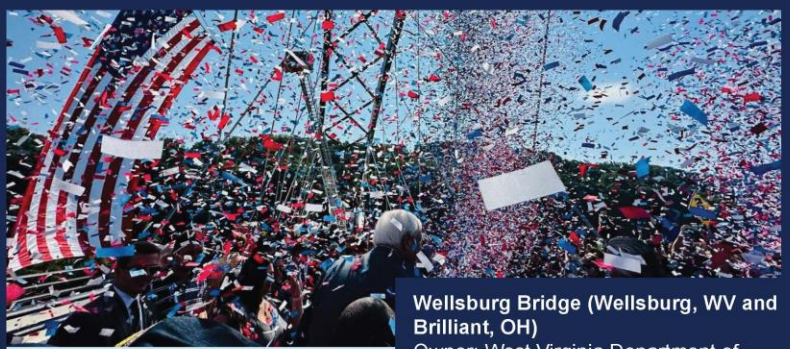
"Floating" Deck System in Arch Span



Erection of Steel Tied Arch System

Innovative Approach: Steel Arch During Float-in Operation

Completed Bridge Connecting Wellsburg, West Virginia and Brilliant, Ohio



"This is an incredible day for both Wellsburg and Brilliant because we are finally opening a bridge connecting these two communities that is long overdue," West Virginia Governor Jim Justice said.

Wellsburg Bridge (Wellsburg, WV and Brilliant, OH)
Owner: West Virginia Department of Highways; Contractor: Flatiron; Project Design Lead: RS&H, Bridge Design: COWI
Entering Firm: COWI, New York, NY

COWI

ACEC Engineering Excellence Awards

Sewering for Environmental Health in Suffolk County, Long Island:
Clean Water for Carlls River Project.

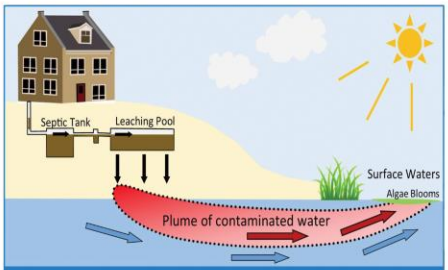
ACEC Engineering Excellence Awards

In 2011, Suffolk County authorized funding for the installation of sanitary sewers for Deer Park, North Babylon, West Babylon and Wyandanch communities to minimize the detrimental environmental impacts to sensitive wetlands associated with failing cesspools and septic systems.

The area's septic tanks, cesspools and leaching pools providing solid waste settling have allowed an estimated 200 pounds of nitrogen per day to enter ground and surface water.

The solution was to redirect sanitary waste from almost 2,300 private residences to the County's regional (Bergen Point) wastewater treatment plant using a low pressure sewer system via an interceptor extension.

Waste from cesspools and septic systems impacted surface waters within the nearby Carlls River, Sampawams Creek, Guggenheim Lake and Belmont Lake, eventually discharging into sensitive wetlands which are a primary means of storm surge protection against the Great South Bay on Long Island's south shore.



In septic tanks and cesspools, organic nitrogen is abundant. Excess nitrogen can cause explosive algae growth which diminishes dissolved oxygen in surface waters, impacting the ecosystem's important wetland areas.

Grinder Pump Units (GPUs) utilizing a 48" x 8' casing were installed using an auger drilling method. GPUs were lowered, casings removed, and holes backfilled and compacted with less property disturbance compared to a standard 10'x10' shoring box.

While typical sewer projects provide a connection point in the right of way for homeowners to connect to in the future at their own expense, this project provided the full installation and closure of the on-site systems at no cost, allowing for immediate environmental benefit.

The new sewer connected to existing Suffolk County Sewer Dictrict No. 3 via a 48" sewer extension micro-tunneled under Southern State Parkway. The process minimized surface disruptions, keeping the road open. Ground freezing supported the excavation and limited groundwater intrusion.

The unique initiative included installing a control panel, disconnect switch and electric meter on privately owned, residential properties. Suffolk County maintains the Grinder Pump Units, pays for the electricity to run them and monitors them through a telemetry system.

PROJECT TITLE & LOCATION
Clean Water for Carlls River, North Babylon, NY

CLIENT'S NAME & LOCATION
Suffolk County Department of Public Works, Suffolk County, NY

ENTRANT'S NAME & LOCATION
D&B Engineers and Architects, DPC, Woodbury, NY

Engineering Wonder

Ensuring Seismic Safety Atop Operating Hospital

Wonder Tower, a recent addition to the Children's Hospital of Richmond (CHoR) at Virginia Commonwealth University (VCU), is the region's only comprehensive pediatric hospital and provides emergency, trauma, and inpatient care services in one facility. Located in downtown Richmond, the 560,000-sf Wonder Tower is situated on a confined site within VCU's medical center and academic campus. The project includes a 280-foot-long enclosed pedestrian skybridge that spans over one of the city's busiest intersections and connects to the VCU Medical Center Main Hospital. The project was delivered on schedule and within the owner's budget.

Key Engineering Accomplishments:

- Wonder Tower is the first major project in Richmond that meets Virginia's new seismic design code
- The horizontal and vertical expansion was constructed overtop and alongside CHoR's existing outpatient pavilion which remained operational throughout construction
- The primary bridge structure segments were erected in one weekend; AR rendering convinced the city to grant a code variance to allow the bridge over the roadway because there were no obstructions to visibility for vehicles and pedestrians
- Additional engineering challenges included designing for efficient constructability in coordination with road closures; securing local code variances for the bridge; and navigating strict vibration requirements for the neighboring medical, academic, and historic government buildings

Project:
Wonder Tower at Children's Hospital of Richmond at VCU
Richmond, Virginia

Client/Owner:
Virginia Commonwealth University
Richmond, Virginia

Submitting Firm:
Dunbar / Walter P Moore
Washington DC

ACEC
American Council of Engineering Companies

ACEC Engineering Excellence Awards

A New Water Supply for 2 Million People

BOIS D'ARC LAKE WATER SUPPLY PROGRAM / BONHAM, TX

North Texas Municipal Water District / Wylie, TX • Freese and Nichols / Fort Worth, TX

The $1.6 billion Bois d'Arc Lake water supply program provides a crucial new water source for North Texas Municipal Water District customers in more than 71 growing cities.

The new system, centered on Texas' first major reservoir in almost 30 years, started delivering up to 70 MGD of water for 2 million+ people in spring 2023, meeting a critical need ahead of one of the hottest and driest summers on record.

Delivering the program required foresight, ingenuity and extensive coordination involving a broad and dedicated array of partners to get multiple interlocking components built and ready across 2018-2023.

The Bois d'Arc Lake program enables NTMWD to execute its service mandate:

BUILDING RESILIENCE in meeting current and future clean-water needs

FULFILLING PROMISES to its customers and member cities

RESPONSIBLY STEWARDING RESOURCES, both fiscal and environmental

The raw water pump station sends water through 35 miles of pipelines to treatment; treated water travels another 25 miles to reach the NTMWD system.

Infrastructure improvements included one of the nation's largest environmental mitigation projects and $50 million in road upgrades.

- 2-mile-long, 90-foot-tall dam, 16,641-acre reservoir and 110-foot-tall intake tower
- State-of-the-art treatment plant and 210-million-gallon terminal storage reservoir
- Two huge pump stations, each the size of a football field with four stories underground
- A total of 60 miles of pipelines for raw and treated water
- 17,000+ acres of environmental improvements, including 70 miles of streams and 6.3 million trees

NORTH TEXAS MUNICIPAL WATER DISTRICT

FREESE AND NICHOLS

ACEC ENGINEERING Excellence AWARDS

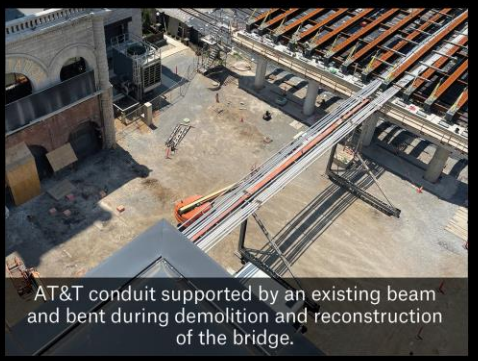
Broadway Viaduct Bridge Replacement

Nashville, Tennessee

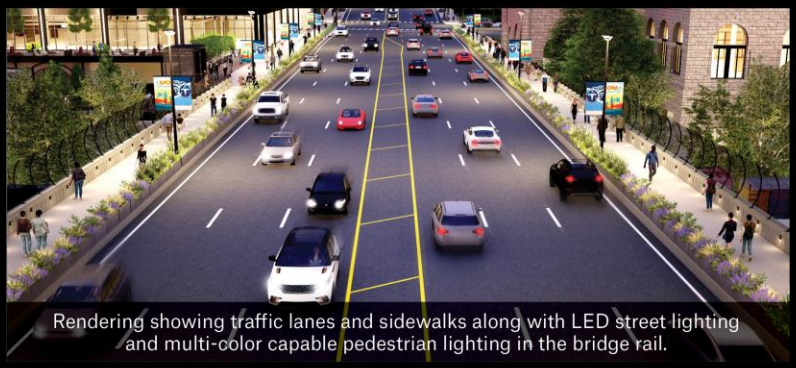
As the main western gateway into Nashville, the Broadway Viaduct Bridge spans five active CSX railroad lines, 11th Avenue South, and a greenway, and it serves as a crucial arterial for the city, carrying not only 26,000 vehicles daily but also critical telecommunications for the downtown area. An incredibly complex endeavor, replacing the existing bridge included working closely with and getting input from many stakeholders such as the Nashville Department of Transportation (NDOT), property owners and developers, and CSX.

The bridge replacement was delivered using the Construction Manager/General Contractor **(CM/GC)** delivery method, where the owner (TDOT), designer (Gresham Smith) and contractor (Kiewit) formed a genuine partnership to mitigate risk, meet the project schedule and improve constructability. To minimize the impacts of the construction to the travelling public, the team used **accelerated bridge construction (ABC)** techniques that resulted in the complete replacement of the bridge superstructure during a mere **8-week full closure** of the bridge. TDOT's goal was to create a new structure that would complement and not overshadow either the historic Union Station hotel or the city's modern developments near the bridge.

Removal of a saw-cut section of the existing bridge during demolition.



AT&T conduit supported by an existing beam and bent during demolition and reconstruction of the bridge.



Rendering showing traffic lanes and sidewalks along with LED street lighting and multi-color capable pedestrian lighting in the bridge rail.

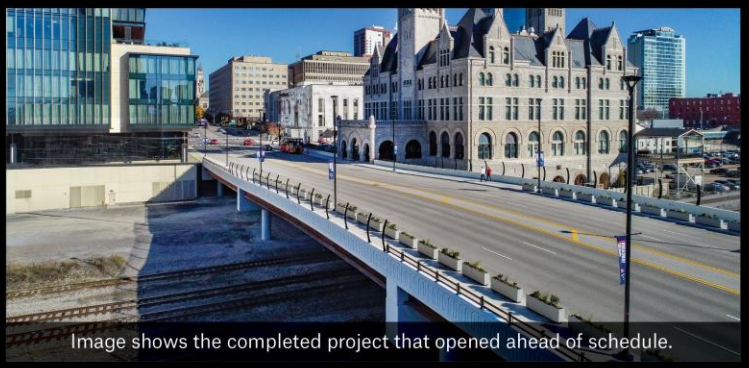
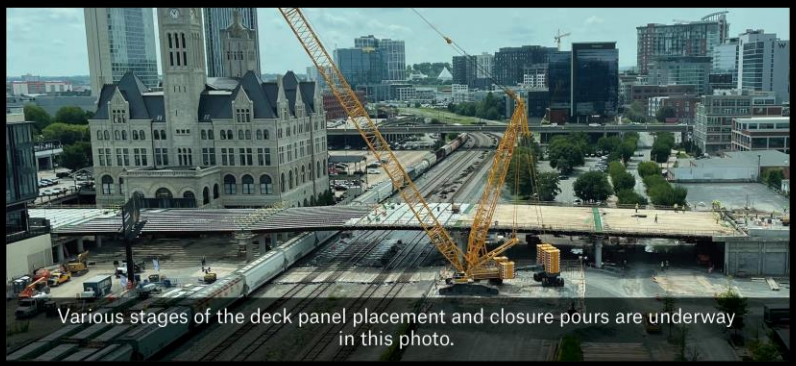


Image shows the completed project that opened ahead of schedule.



Various stages of the deck panel placement and closure pours are underway in this photo.

After the 8-week full closure, the new bridge is opened to 4 lanes of traffic and pedestrians on one side.

Seward Highway MP 75-90

Road and Bridge Rehabilitation

Originally completed in 1951, the Seward Highway is the only road between Anchorage and the Kenai Peninsula. Recognized for its scenic, natural, historic and recreational values, it's one of America's most remarkable drives and connects communities, recreational areas, ports, world class fishing locations and popular tourist destinations.

In March 1964, the magnitude 9.2 Great Alaskan Earthquake severely damaged the roadway. Reconstruction began two years later and completed in May 1968. Nearly half a century later, the roadway has reached the end of its design lifespan.

The 15-mile, $138 million Seward Highway Mile Post 75-90: Road and Bridge Rehabilitation project transformed the highway from a challenge into a dream. The team straightened curves; reconstructed or rehabilitated and seismically upgraded nine bridges; provided five miles of passing lanes in each direction and turn lanes at critical intersections; repaved the entire stretch; enhanced pedestrian facilities; improved drainage; and protected shorelines. With three new underpasses and an extended multimodal scenic trail, the project increases pedestrian safety and improves access to recreational spots.

The project overcame significant challenges, including a two-decade project timeline, maintaining traffic for more than 20,000 vehicles per day, 30-foot tidal fluctuations, a shortened construction season and frigid winters, and extreme seismicity and highly liquefiable soils. The team also remained vigilant for critical and endangered species, including Beluga Whales that propagate the Turnagain Arm.

The project transforms one of America's most remarkable roadways from a fraught drive into a modern marvel.

HDR

ACEC Engineering Excellence Awards

Title: Seward Highway MP 75-90 Road and Bridge Rehabilitation | Anchorage and Kenai Peninsula Borough, Alaska

Client/Owner: Alaska Department of Transportation & Public Facilities | Anchorage, Alaska

Entrant: HDR | Anchorage, Alaska

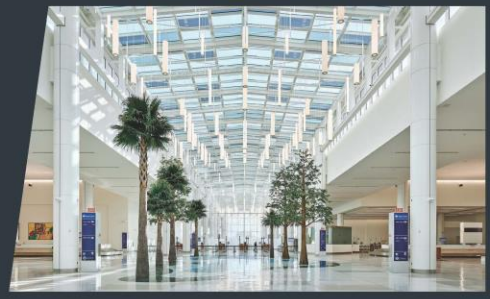
ORLANDO TAKES FLIGHT

ORLANDO INTERNATIONAL AIRPORT TERMINAL C

Orlando, Florida

CLIENT: Greater Orlando Aviation Authority

FIRM: HNTB Corporation | Orlando, Florida



A new 1.8 million square feet aviation facility has revolutionized the way travelers navigate and explore Orlando International Airport, providing a seamless and unforgettable journey for the millions of visitors that come through its doors. From arrival to departure, this remarkable $2.8 billion facility enhances every aspect of the Orlando Experience™ and fully reflects the natural beauty of Central Florida.

Terminal C provides a positive and welcoming experience, while maximizing the safety, security and efficiency of the travel process. The project increases airport capacity by 20% and incorporates many industry firsts:

- 100% total virtual ramp control for ground operations
- 100% automated screening lanes at TSA checkpoints
- 100% facial recognition e-gates
- Bags first design that streamlines processing and provides 60% energy savings
- Fully integrated, multimodal transportation hub
- 100% trackable RFID baggage handling system
- 15 common-use swing gates

Terminal C provides an exemplary passenger experience and confirms Orlando's position as the No. 1 tourist destination in the world.

ACEC Engineering Excellence Awards

HNTB

555 Greenwich: Engineering for the Next Generation

When Hines, Trinity, and Norges Bank set out to design 555 Greenwich, they faced a big decision: Would it be one of the last buildings of the previous generation or the first building of the next? They opted for the latter and succeeded beyond all initial objectives and criteria. Working from a design with all the delicate layering and intricate precision of a Swiss watch, the design team utilized cutting-edge techniques, such as radiant heating and cooling, fossil fuel-free heat pumps, on-demand ventilation, installation of new geothermal caissons, and storing thermal energy in the concrete superstructure, to become the first completed commercial office building in NYC that is entirely fossil-fuel-free. 555 Greenwich expects to significantly exceed New York City's Local Law 97 carbon-reduction targets for commercial office buildings and serve as an avatar of forward-thinking design for a sustainable and environmentally responsible future built environment.

Air-source heat pumps exchange energy with the geothermal system and utilize condenser water heat recovery, technologies never before paired in this type of application in New York City.

The PEX tubing, sitting in a 2 inch topping slab, can take a significant portion of the heating and cooling load from what would otherwise require extensive ceiling ductwork. The radiant floor radiates up and down, utilizing the structural slab as a thermal battery.

Central 100% outside air dual wheel energy recovery units with UV lights provide point-of-use ventilation and enhanced indoor air quality.

Installation of the 100% dual wheel energy recovery units behind an architectural screen wall and stormproof louver, the combined system of which needed to be tested to confirm adequate airflow into the building.

The drilling of structural wells with the geothermal pipes located within the enclosure.

ACEC Engineering Excellence Awards

Project: 555 Greenwich | New York, NY

Client: Hines; Trinity Church Wall Street; Norges Bank Investment Management | New York, NY

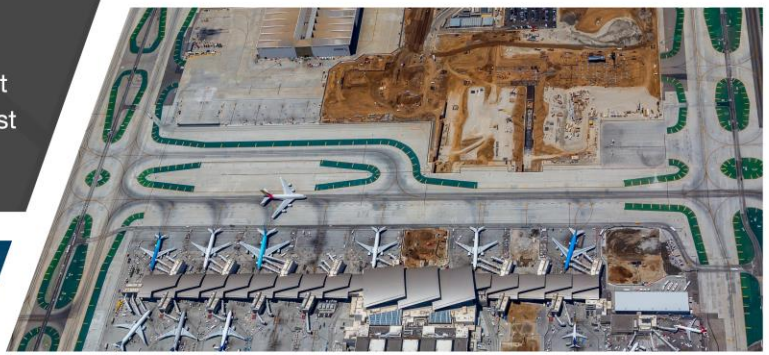
Entrant: JB&B | New York, NY

Photo By Joe Thomas

LAX West Gates at Tom Bradley International Terminal

Los Angeles, CA

As part of the Turner-PCL Joint Venture Progressive Design-Build team, Kimley-Horn was selected by Los Angeles World Airports (LAWA) to provide engineering design services for this innovative terminal expansion project at Los Angeles International Airport (LAX). The 15-gate concourse features cutting-edge technology, impressive architecture, a new checked-bag storage system, biometric boarding gates, and the latest facilities for travelers to experience. In addition to the modernized passenger amenities, the project also improved scheduling challenges, providing increased flexibility for both domestic and international flights at LAX, an economic cornerstone of the Los Angeles community. In all, the project combined advanced technology, engineering ingenuity, and practical sustainability to deliver a $1.73 billion program that touched every aspect of engineering at one of the world's busiest airports during an unprecedented COVID-19 pandemic.



ACEC ENGINEERING *Excellence* AWARDS

LAWA
LOS ANGELES WORLD AIRPORTS

Los Angeles, CA

Kimley»Horn

Orange, CA

kpff

University of Idaho
ICCU Arena

The University of Idaho ICCU Arena is a landmark project for mass timber, stretching the shapes and spans that can be crafted out of wood. This new 4,200-seat arena is home to the Vandal men's and women's basketball teams, equipped with a performance court, practice gym, locker rooms, and coaching offices.

Designed to be a flexible, multi-use space, the arena can also be utilized as a venue for concerts, speakers, and academic events. It is a gateway to campus and to learning, designed as a living laboratory with a fully exposed roof structure and timber members that visitors can touch.

University of Idaho

ACEC Engineering Excellence Awards

PAC ■ NYC

A TESTAMENT TO RESILIENCE and the healing power of art, the Perelman Performing Arts Center (PAC NYC) completes Manhattan's 16-acre World Trade Center site and 9/11 Memorial. Reverent during daylight, an illuminated lantern at night, the deceptively simple form belies a one-of-a-kind, immensely complex structural system with a shapeshifting interior for ultimate performance flexibility.

With a foundation designed for a different-sized building and atop a four-level-basement maze of infrastructure, the site seems the "absolute wrong place to build a performing arts center." And yet, MKA's gravity-defying structure utilized a "bottom-up" vs. "top-down" design approach to arrive at **just seven super-columns** supporting the entire building and, in a bit of architectural and structural serendipity, resulted in a **dramatic 50-foot cantilevered entry corner!**

The unmatched performance space showcases three **structurally independent and acoustically isolated** "floating" theaters and the world's largest theater "guillotine" doors. The giant kinetic interior structure is reconfigurable, able to create an unheard of **11 different volumes and 60-plus configurations.**

PAC NYC is as beautiful as it is complicated, as respectful as it is celebratory, and sets a new worldwide structural benchmark for future flexible theaters.

PERELMAN PERFORMING ARTS CENTER

PERELMAN PERFORMING ARTS CENTER AT THE NEW YORK WORLD TRADE CENTER

OWNER: Perelman Performing Arts Center **CLIENT:** EXECUTIVE ARCHITECT: Davis Brody Bond | DESIGN ARCHITECT: REX | New York, NY

ACEC Engineering Awards

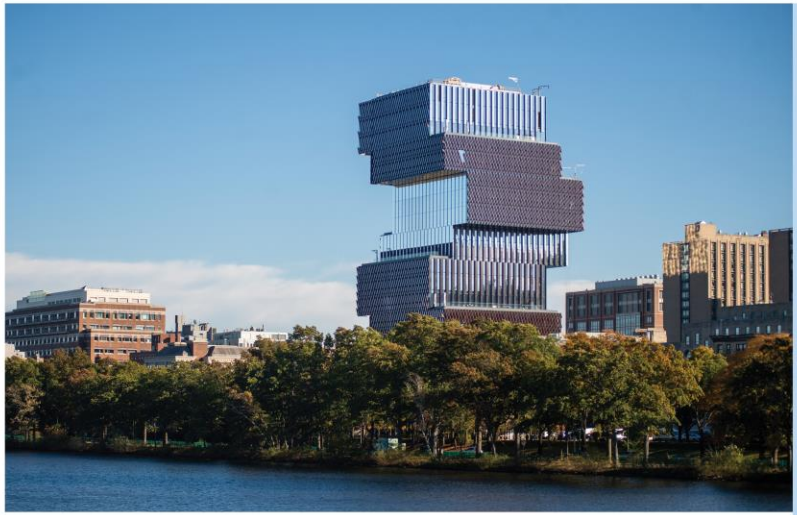
MAGNUSSON KLEMENCIC ASSOCIATES
Structural + Civil Engineers

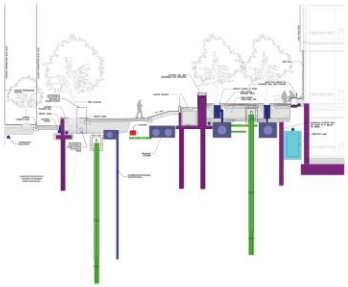
AT LEFT: Three main theater spaces provide limitless performance configurations. The agility is made possible by innovative structural and kinetic engineering design solutions. **ABOVE:** PAC NYC sits alongside the 9/11 Memorial & Museum and One World Trade Center. Solemn and respectful by day, the façade of translucent marble panels comes aglow in lower Manhattan at night.

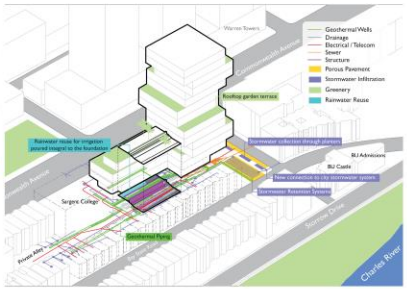
IMAGES: IWAN BAAN, PAC NYC, REX

BU Center for Computing & Data Sciences

Boston, MA







Images, clockwise from top:

A. CCDS over the Charles River
B. Axon view showing the stormwater, utility, and other infrastructure elements in the crowded site
C. Street view of main entrance, showing public spaces and bioretention planters
D. Cross section highlights how stormwater system fits in the site

The Boston University Center for Computing and Data Sciences (CCDS) converted a parking lot into Boston's greenest building – a LEED Platinum building that will reach carbon neutrality by 2040. Nitsch Engineering overcame significant site constraints on the two-acre urban site to design an innovative system that manages stormwater from the CCDS and 28 adjacent properties.

The design was complicated by the fact that the site interior was eight feet below adjacent street grades and over 600 feet from a closed drainage system low enough to convey stormwater from the site. A standard sloped pipe network wouldn't work, so Nitsch designed a unique flat plane conveyance system supplemented with porous paver systems and planter areas, stormwater injection wells, and rainwater harvesting. Stormwater elements were located in a constrained space that also holds 31 geothermal wells and associated piping, sewer infrastructure, electrical and communications duct banks, and several structural retaining wall footings.

Nitsch coordinated permitting for features that promote community access and safety. Converting Granby Street to two-way with a raised cycle track improves bicycle safety. Wider Commonwealth Avenue crosswalks and on-site bike parking encourage non-vehicular access. Rideshare drop-off areas, a parklet, public seating, and a welcoming alley further the community focus.

The iconic offset façade allows more space for green roofs, which are irrigated by an integrated rainwater harvesting system. Interactive lobby displays educate the public about sustainable building features.

As the City of Boston moves towards a more resilient future, the CCDS provides a high-profile model for successful sustainable engineering.

ACEC
American Council of Engineering Companies

Submitted by:
Nitsch Engineering
Boston, Massachusetts

Owner:
Boston University
Boston, Massachusetts

ACEC Engineering Excellence Awards

Budd Inlet Treatment Plant

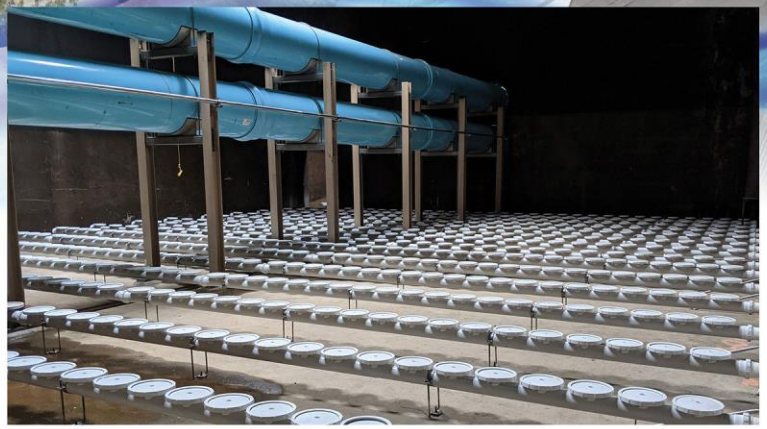
BIOLOGICAL PROCESS IMPROVEMENTS

LOTT CLEAN WATER ALLIANCE
OLYMPIA, WASHINGTON

Since 1994, LOTT has employed biological nutrient removal (BNR) at its Budd Inlet Treatment Plant to meet the most stringent discharge limits in the Puget Sound region. The Biological Process Improvements project takes BNR to the next level by reconfiguring and consolidating the BNR process, enhancing monitoring and controls, and replacing aging equipment with state-of-the-art technologies.

The project involved reconfiguring an existing treatment basin the size of a city block with a capacity of more than ten million gallons into five separate treatment trains, each with multiple cells with advanced instrumentation and controls to monitor and adjust oxygen conditions in real-time to optimize nutrient removal.

The resulting treatment performance is excellent, with total inorganic nitrogen levels as low as 0.4 mg/L and averaging 1.6 mg/L, compared to the 3.0 mg/L permit limit, improving water quality in Budd Inlet. The project also significantly reduces energy use through installation of highly efficient pumps, enhanced aeration control, and advanced instrumentation and controls technology. Energy savings are estimated at 2.5 million kilowatt-hours per year, representing utility cost savings of over $180,000 annually and offsets 1,143 tons of carbon dioxide.



LOTT Clean Water Alliance
Olympia, Washington

Parametrix
Puyallup, Washington

ACEC Engineering Excellence Awards

CENTRAL 70 PROJECT DENVER, COLORADO

INNOVATIVE TECHNIQUES

- New application of e-construction technology for CDOT to limit re-work and quality issues
- New risk-based auditing system to prioritize critical items improved quality conformance by 30%

FUTURE ENGINEERING VALUE AND PUBLIC AWARENESS

- 15 years of comprehensive public outreach to select the most beneficial alternative
- AASHTO's TransComm and PRSA awards
- Design Advisory Group to provide communities with sense of ownership and control over specific design elements
- Nearly 300,000 people reached through social media accounts

SOCIAL, ECONOMIC, AND SUSTAINABLE DEVELOPMENT

- One of the most impactful projects of our generation, projected to result in $18B of new economic activity in Colorado by 2040
- More than 150 community commitments without precedent in Colorado
- $2M affordable housing grant & $100,000 fresh food grant
- 760,000 hours of local workforce hired, many attending new local on-the-job training center

COMPLEXITY

- State-of-the art tunnel and pump systems with monitoring and control functions to improve safety and incident management
- New at-grade cross street bridges and four-acre cover park over lowered I-70 section to improve community connection
- Demolition of a 2.5-mile-long viaduct in three months next to buildings and live traffic
- Advanced environmental testing, monitoring, and remediation programs

SUCCESSFUL FULFILLMENT OF CLIENT NEEDS

- Completed on budget and one month ahead of schedule
- High-risk items identified and mitigated early in project development using Design-Build and P3 delivery methods
- Reconnected communities of Swansea and Elyria
- Safely removed the lowest rated structure in Colorado
- Engaged neighboring communities in project decisions and professional development in the construction industry

Entrants: RS&H, Inc. and AtkinsRéalis; Denver, Colorado

Client: CDOT Denver, Colorado

COLORADO Department of Transportation

ACEC ENGINEERING Excellence AWARDS

TSX–Broadway Uplifted

TSX Broadway was created by *shifting and reassembling* portions of an existing structure—including the historic Palace Theater—and combining them with new elements to produce a *revitalized* entertainment, retail, and hotel complex at the center of *Times Square* in New York City.

The landmarked theater, built in 1910, was *lifted an astonishing 31 feet* into the air to allow street-level commercial space to be added and a second cellar excavated. The 16-story podium is topped by *44-foot-deep post-tensioned concrete girders* that span 140 feet to transfer a 32-story hotel tower over the theater.

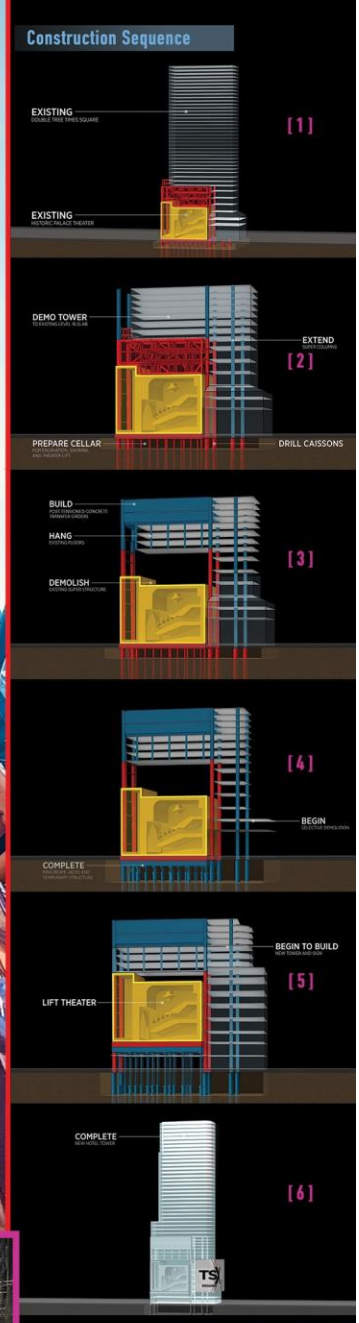
TSX Broadway's 18,000 sq. ft., *wrap-around LED screens* open to reveal the *Icon Stage*, which projects 30 feet above Times Square, bringing light and live entertainment to visitors below.


Post-Tensioned Transfer Level

Palace Theater and Hotel Tower


Ring Beam–Before Theater Lift

Ring Beam–After Theater Lift



Project: TSX Broadway and Palace Theater Redevelopment
New York, New York

Client: L&L Holding Company
New York, New York

Structural Engineer:
Severud Associates
Consulting Engineers P.C.
New York, New York

ACEC ENGINEERING Excellence AWARDS

Stantec | ACEC Engineering Excellence Awards

LONG ISLAND RAIL ROAD
THIRD TRACK EXPANSION PROJECT

CLIENT
3rd Track Constructors JV
Lawrence, NY

ENTRANT FIRM
Stantec Consulting Services Inc.
New York, NY

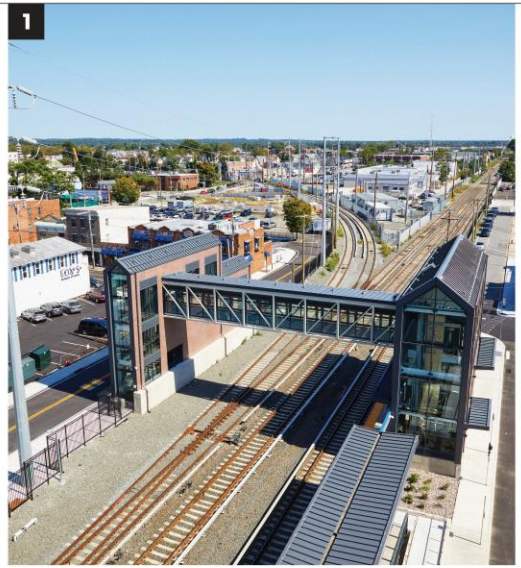
LONG ISLAND, NY

The Long Island Rail Road (LIRR) Third Track Expansion Project upgraded a two track 9.8-mile stretch of the most heavily utilized commuter rail line in North America on Long Island, NY. The project's main goal is to add a third track to the main line, which will substantially improve train operations and safety. To add this third track, many existing infrastructure elements were modified and/or replaced. To improve public safety, six grade crossings were eliminated by constructing bridges over newly depressed roadways. The project also included the complete replacement of five LIRR stations, making them fully ADA accessible as well as implementing new technology to bring all the railroad systems up to current state-of-art standards.

With so many modifications required to upgrade the existing railroad infrastructure, the project team used innovative accelerated bridge construction techniques such as hydraulic bridge jacking, to reduce impacts to the LIRR and to the public—maintaining community safety, with minimal impact to commuters, revenue service, and adjacent communities.

A key component of region-wide transit improvements, LIRR Third Track Expansion Project facilitated the optimal use of the newly completed multi-billion-dollar Grand Central Madison station (a.k.a. East Side Access) project. Our firm's design and close partnership with the construction team meant that this transformational transit project was delivered within the MTA project budget and schedule and with minimal impacts to the traveling public and mostly within a very constrained 66-foot right-of-way.

1



2

3

4

5

6

Captions: *Photo 1*—Main Street Pedestrian Overpass showing the new project infrastructure, including the Mainline and Oyster Bay Branch interlocking, third track, high voltage transmission line poles, traction power substation, and employee facility. *Photo 2*—Passenger shelters at stations provide brand new amenities such as seating, USB charging ports, infrared heaters, and audio-visual train information, while also serving as rich canvases for MTA Arts & Design commissioned art glass. *Photo 3*—New Hyde Park Undergrade Crossing Railroad and Pedestrian bridges over the newly depressed roadway. *Photo 4*—Hydraulic jacks pushing the completed Covert Avenue Undergrade Crossing railroad box bridge into place. *Photo 5*—Denton Avenue Bridge superstructure and deck being constructed south of the railroad tracks and pushed into place by hydraulic jacks during a weekend outage. *Photo 6*—Design-phase rendering of the proposed Carle Place Station reconstruction showing new overpass building and platforms.

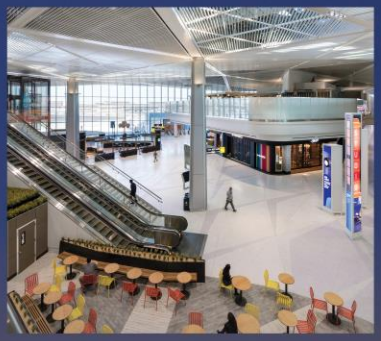
NEWARK LIBERTY INTERNATIONAL AIRPORT

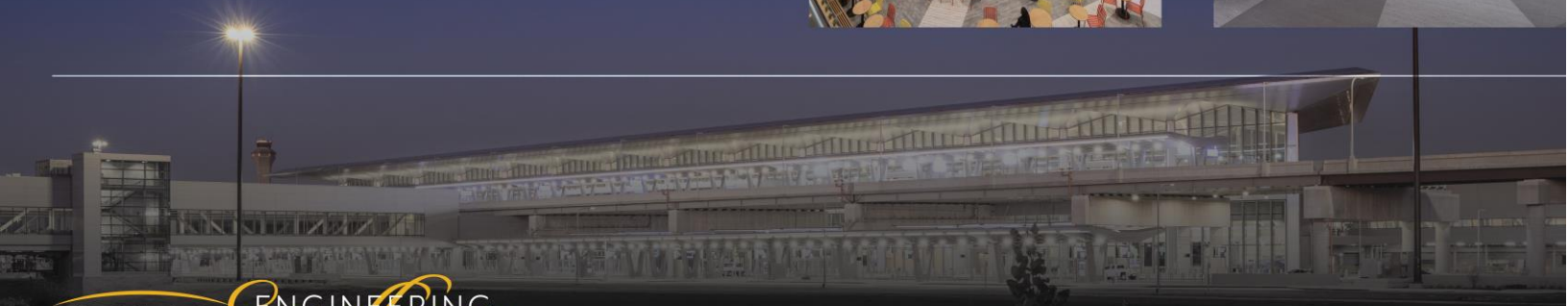
NEW TERMINAL A

The new Terminal A at Newark Liberty International Airport (EWR) replaces the existing terminal with a new 1-million-square-foot, 33-gate domestic terminal. The Terminal A Redevelopment Program includes eight new bridges and roadways, a new car rental and parking facility and 1.4 acres of airfield paving improvements.

Opened in January 2023, Newark Liberty's Terminal A was the largest design-build infrastructure program in New Jersey state history. The new terminal, operated by the Port Authority of New York and New Jersey (PANYNJ), can accommodate more than 13.6 million annual visitors and is designed to meet the increasing volume and needs of travelers for years to come.

STV served as architect- and engineer-of-record as part of a design-build consortium, designing the terminal building and 660-foot pedestrian bridge, and providing structural engineering and MEP engineering services. Featuring a steel superstructure and soaring floor-to-ceiling windows that bathe the interior with abundant natural light, the LEED Gold-certified terminal boasts the country's first fully automated security screening checkpoint and the latest technology. Terminal A celebrates the history and people of the state of New Jersey while also looking to the future.





ACEC ENGINEERING *Excellence* AWARDS

All photos taken by James Ewing

Newark Liberty International Airport New Terminal A,
Elizabeth, NJ

Port Authority of New York and New Jersey,
New York, NY

STV,
New York, NY

View of Pedestrian Bridge B which connects the New Terminal B Headhouse to the Island Concourse B from an airside vantage point. This element allows for planes to taxi in either direction from each gate.

LAGUARDIA CENTRAL TERMINAL B REPLACEMENT

QUEENS, NEW YORK

Seeking to modernize facilities while addressing aircraft congestion and passenger comfort at New York's LaGuardia Airport (LGA), LaGuardia Gateway Partners and the Port Authority of New York and New Jersey launched an $8 billion transformation project in 2011, $4 billion of which was dedicated to the Terminal B design-build project. ***This investment resulted in LGA's new Terminal B being awarded UNESCO's prestigious 2021 Prix Versailles for Best New Airport in the World.***

This complex project posed many challenges to the design team like working within a notably limited footprint and ensuring airport operations continued with minimal interruption throughout construction. One of the project's most notable features is a pair of dual elevated pedestrian bridges connecting the headhouse and island concourses. These walkways allow aircraft taxiing beneath and offer impressive views of the airfield and the city skyline. This design innovation resulted in 50% added overall taxiway for aircraft and allows for dual direction taxi maneuvering from every gate.

LGA's Terminal B project is among the largest public-private partnerships in American history and the largest in U.S. aviation.

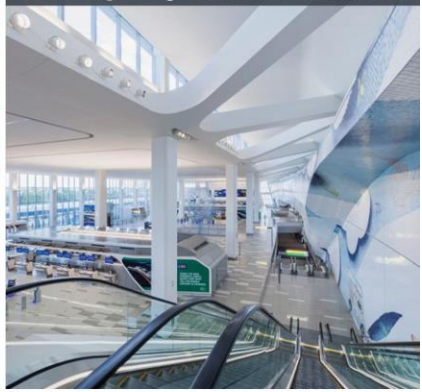
WSP USA Inc.
New York, NY

LaGuardia Gateway Partners
Queens, NY

ACEC Engineering Excellence Awards

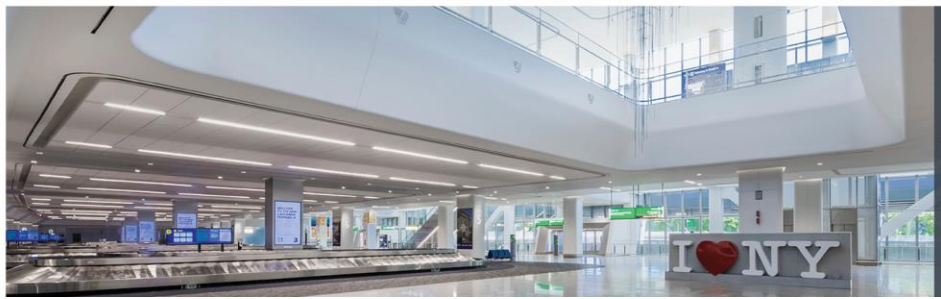
A shift from the original finger design to an island design now allows aircraft taxi in both directions. This design resulted in a 50% increase in airside space.

Inside the new Terminal B Headhouse from Level 4 as passengers enter the arrivals level.



Interior of elevated Pedestrian Bridge B. Full height windows provide a view of the airfield and aircraft taxi beneath.

Concept rendering of Concourse B as passengers enter from the Pedestrian Bridge.



The baggage claim arrivals area within the new Terminal B Headhouse features a view of the upper departures level and site specific art installation by Sarah Sze titled "*Shorter than the Day*".