



Case Study / MTA Contract HC-07

Hugh Carey Tunnel

Design-Build Replacement of Fan Motors & Installation of the First High-Pressure Water Mist Fire Suppression System in North America

\$72M
Contract Value

104
Custom Motors

6,000'
Suppression Coverage

2x
ACEC Awards

Modernizing one of NYC's most critical infrastructure arteries

The Hugh Carey Tunnel, originally opened in 1950 as the Brooklyn-Battery Tunnel, is the longest continuous underwater vehicular tunnel in North America, carrying over 54,000 vehicles daily between Brooklyn and Lower Manhattan.

Under MTA Contract HC-07, Navillus served as General Contractor on one of the most technically demanding design-build infrastructure projects in the New York metro area: replacing the tunnel's aging ventilation fan motors and engineering a first-of-its-kind fire suppression system, all while keeping the tunnel operational for daily traffic.

Navillus managed all phases from design through procurement and installation, coordinating a team of 80 to 100 professionals across multiple trades and working through some of the most challenging conditions in tunnel construction, including the onset of the COVID-19 pandemic.



Key project data at a glance



CLIENT / OWNER

MTA
Bridges & Tunnels

PROJECT TYPE

Transportation Infrastructure
Design-Build

LOCATION

160 Hamilton Avenue
Brooklyn, NY

DURATION

December 2018 -
October 2021

TEAM SIZE

80-100 Professionals,
Consultants & Subcontractors

ENGINEERS

Shenoy (MEP)
SGH (Structural)

KEY CONSULTANTS

WMS
Fogtec
JW Mooney
Mott McDonald

KEY SUBCONTRACTOR

KG Power

**CUSTOM MOTOR DESIGN
& MANUFACTURING**

Louis Allis

ARCHITECT

Wai Tong Chan

First-of-its-kind engineering in one of NYC's most constrained environments

Custom Fan Motor Design with No Existing Documentation

Challenge

The tunnel's original fan motors, critical first-line-of-defense systems in a tunnel fire, had no surviving design documentation. New motors needed to meet rigorous performance parameters to maintain code compliance.

Solution

Working with our subcontractor KG Power, Navillus removed approximately 24 existing fan units and sent them for comprehensive laboratory testing. The resulting data informed the design and manufacture of 104 new custom motors rated up to 300 HP, installed across all four ventilation buildings.

First-in-North America Fire Suppression System

Challenge

Design and install a high-pressure water mist fire protection system spanning 3,000 feet in each tunnel tube, never before deployed in North America, and the first globally for this ventilation configuration.

Solution

Navillus led extensive design development including full-scale mockups and live testing within the tunnel to validate performance. International specialists coordinated system components from Germany.

Working Inside a 70-Year-Old Active Tunnel

Challenge

Primary work areas, the exhaust air plenums above the tunnel roadways, were confined, difficult to access, and required nighttime roadway closures to maintain traffic flow.

Solution

Rigorous confined space evacuation procedures, comprehensive rigging and fall protection protocols, and carefully scheduled overnight installations. Fan motors were delivered by barge to Governors Island.

NFPA 502 Compliance in a Legacy Structure

Challenge

Achieving NFPA 502 compliance in a structure built in the 1940s presented significant engineering constraints. Standard fire testing approaches were not feasible.

Solution

The team deployed advanced Computational Fluid Dynamics (CFD) analysis combined with equivalency analysis benchmarked against the SOLIT fire testing series. A first for regulatory approval in a North American tunnel.

Pioneering techniques that set new industry standards



- ➔ High-pressure crimped stainless steel pipe fittings to reduce welding in confined tunnel spaces
- ➔ High-pressure flexible hoses to address thermal expansion and complex installation constraints
- ➔ Pre-assembled electrical panels to streamline valve control and reduce on-site installation time

Delivered on time. On budget. Zero compromises.



- ✔ On Time. \$72M project delivered on schedule
- ✔ On Budget. No cost overruns
- ✔ Outstanding safety record throughout entire project duration
- ✔ Pioneered North America's first tunnel fire suppression system of its kind
- ✔ Successfully completed through the COVID-19 pandemic without schedule impact

Fan Motor Modernization

BEFORE



AFTER



104 custom motors rated up to 300 HP replaced aging units with no surviving design documentation, restoring full ventilation capacity across all four buildings.

Industry Recognized Excellence



DUAL RECOGNITION

ACEC *New York*

American Council of Engineering Companies of New York

AWARDS RECEIVED

EXCELLENCE IN ENGINEERING

Platinum Award

2024

American Council of Engineering Companies
New York Chapter

SPECIAL PROJECTS AWARD

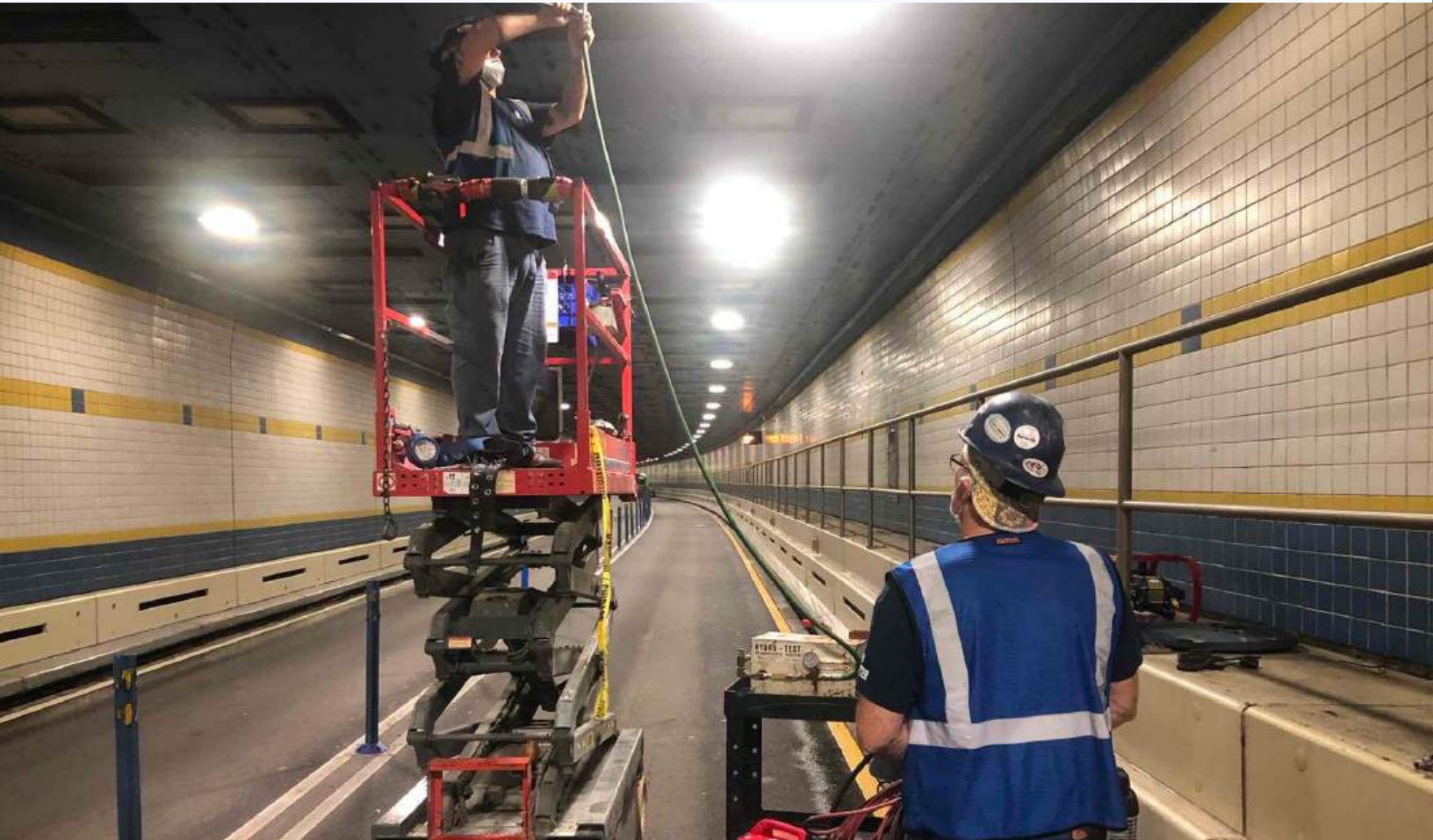
2023

American Council of Engineering Companies
New York Chapter

"This project set a new standard, not just for Navillus, but for tunnel safety infrastructure across the country."

— Colin Mathers, CEO, Navillus

The success of HC-07 positioned Navillus to compete for even larger opportunities



MTA Bridges & Tunnels awarded Navillus a new **\$138 million** design-build contract through competitive procurement to extend the fire suppression system within the Hugh Carey Tunnel and to design and install a new system in the Queens Midtown Tunnel.

The experience gained on HC-07 demonstrated that Navillus was the most qualified, responsive, and responsible bidder for the job.

\$138M

Design-Build contract won



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