HDD
NAVAL FACILITIES ENGINEERING COMMAND
2017, Ford Island, Oahu, HI
• 3,500-linear-foot installation
• 30-inch steel diameter casing and 24-inch fused pipe
• Under Pearl Harbor, protection for historic runway
• Variable geological conditions; unfavorable soil conditions.

TUNNELING
BLACKLICK CREEK SANITARY INTERCEPTOR SEWER
2016-2020, Columbus, OH
• Earth pressure balance boring machine
• 22,620-foot long, 12-foot diameter precast concrete tunnel liner
• 10 shafts and manholes
• 12 curves, up to 3,600-foot radius

DIRECT PIPES
CALUMET RIVER CROSSING
2017, Chicago, IL
• 1,530-linear-foot installation
• 36-inch steel pipe
• 500-ton Direct Pipe machine
• 7-degree entry and exit; 9.8 degree horizontal curve

PIPE REHABILITATION
16TH AVENUE SANITARY SEWER REHABILITATION
2017, Markham, ON, Canada
• 106-inch-diameter sanitary sewer pipe
• Spray-on geopolymer liner
• 130-feet below ground level
• Active bypass system including inline plug
TUNNELING/MICROTUNNELING
Michels uses a variety of tunnel boring machines (TBM) and techniques to construct tunneling for pipelines, water mains, and storm and sanitary sewers.
- Earth pressure balance TBM
- Open face TBM
- Slurry TBM
- Conventional drill blast
- Sequential excavation
- Remote control (microtunnel)
- Wet retrievals

HORIZONTAL DIRECTIONAL DRILLING (HDD)
Powered by the largest fleet of 1.2 million pound thrust/pull force capacity rigs in the world, Michels uses HDD to install pipe up to 60 inches in diameter and 15,000 feet in length in a single pull. Gyroscopic and surface tooling holds the drill path to the prescribed alignment.
- Land-to-land
- Land-to-water
- Water-to-water

DIRECT PIPE
Michels is among the most experienced contractors performing this emerging trenchless technology that combines elements of HDD and tunneling. Direct Pipe combines a thruster with a steerable microtunneling machine to install steel pipes in one pass.
- Diameters from 36 to 60 inches
- Up to 4,500 feet
- Up to 1.6 million pounds of force
- Effective in all soil conditions

PIPE SERVICES
Michels uses a variety of methods to maintain and rehabilitate sewer mains, potable water mains, pressure pipes, manholes and culverts. Cured-in-place pipe (CIPP) systems use water, steam and ultraviolet light to cure liners, resulting in a freestanding pipe within the host pipe. Spray-in-Place Pipe (SIPP) systems apply cement mortar, epoxies, geopolymers and polyureas inside pipes to improve driving water quality and prevent further internal degradation.

BORING & RAMMING
Effective for crossings under roads, driveways and other relatively short crossings, these economical and ecological methods use rotating augers and pneumatic hammers to install pipes either by cutting or jacking.
- Auger boring
- Guided boring
- Pipe ramming

PIPE BURSTING & SLIPLINING
Michels has several methods for conveniently replacing all or sections of an existing pipeline. With pipe bursting, an expander head is hydraulically guided through an existing pipe, breaking it and allowing for a new, larger pipe to get pulled into its place. Sliplining involves inserting smaller-diameter pipe segments into an existing pipe and grouting annual space to repair and extend the life of a deteriorating structure.
- Sequential excavation
- Remote control (microtunnel)
- Wet retrievals
- Effective in all soil conditions

YOUR STORY IS TOLD THROUGH THE THINGS WE BUILD.