

Deploying open-access fiber-to-the-premises in Holland, Michigan

The Holland (Michigan) Board of Public Works (HBPW) has built one of the most advanced open-access fiber networks in the upper Midwest, delivering gigabit connectivity to residents and businesses across the city. HBPW had previously constructed and operated fiber for its internal use and quickly began serving local anchor institutions and business customers; its expansion to citywide service followed a decade-long partnership with CTC, beginning with a feasibility analysis in 2015 and continuing through construction oversight today.



CTC has helped with:

- **Business planning and financial analysis**, spanning market research, feasibility studies, and financial pro forma development
- **Engineering and design**, encompassing field surveys, route engineering, and final design documentation
- **Procurement support**, including bid package preparation and contractor evaluation
- **Construction management**, from owner's representative services to on-site inspection and as-built documentation review

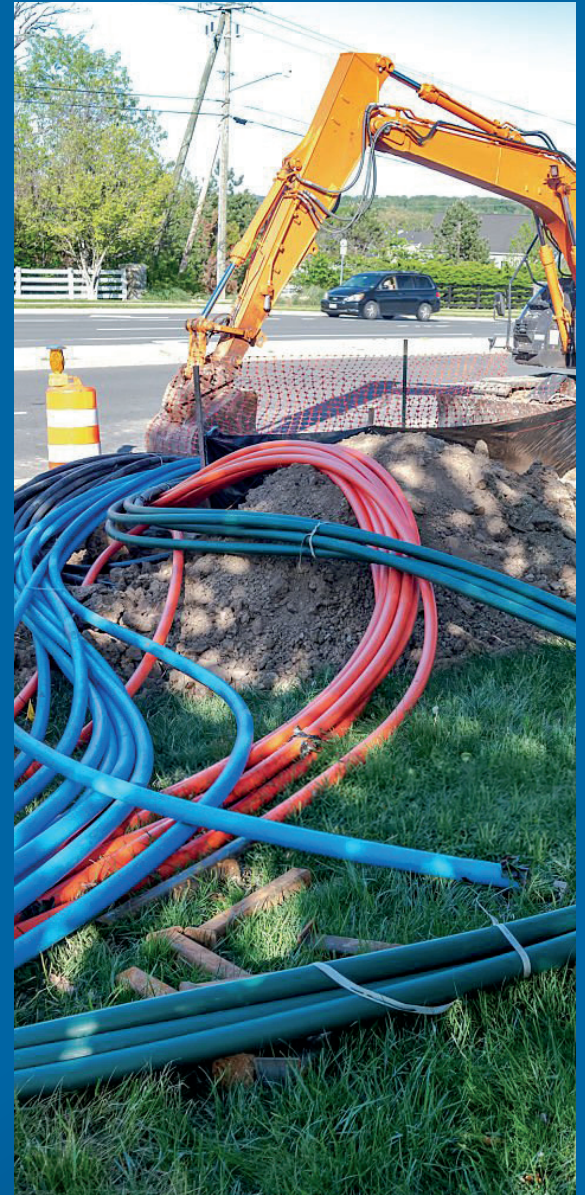
Through field-verified cost estimation, future-proof architecture design, strategic materials procurement, and on-site construction oversight, HBPW built infrastructure designed to meet community needs well into the future.

Field-verified cost estimation mitigated the risk of overruns

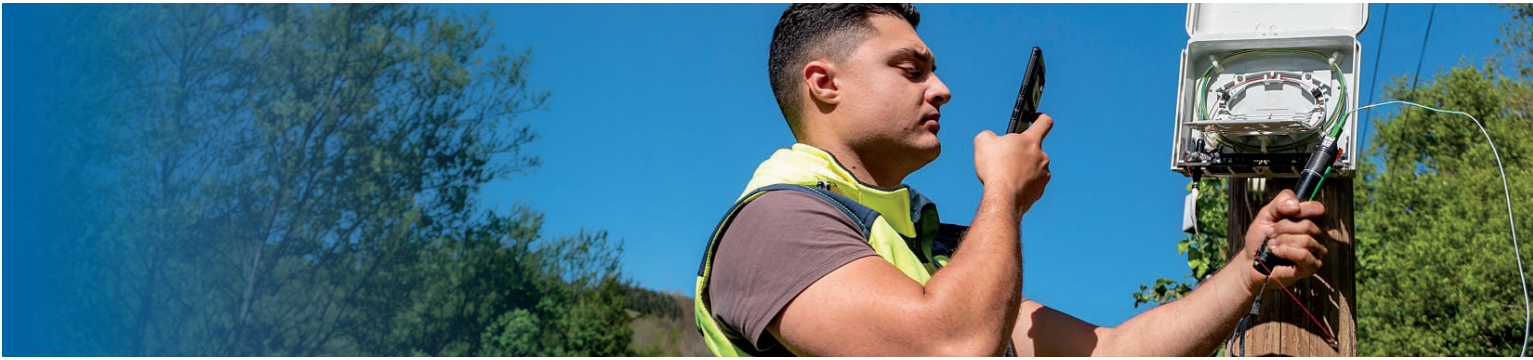
Accurate cost estimation matters because it determines whether a project stays on budget. Underestimating costs leads to funding shortfalls, project delays, and eroded public trust. Overestimating costs can prevent worthwhile projects from moving forward at all.

CTC's approach relies on field verification rather than generalized unit pricing. For Holland, CTC engineers conducted a combination of desk reviews and on-site surveys examining utility pole space, pole conditions, and underground construction challenges. Engineers developed a system-level design and generated GIS-based map data for each network layer, from backbone fiber routes to service drops for each address.

This work produced cost estimates on a per-phase basis that proved largely accurate during construction. The detailed design also enabled HBPW to order materials in advance of contractor procurement, avoiding delays from long lead times.



“Accurately estimating costs ensures reliable funding, keeps projects on schedule, and strengthens public trust.”



Future-proof architecture maximized HBPW's network value

Network infrastructure represents a multi-decade investment. Design decisions made today determine whether a network can adapt to technology changes and growing demand over its full useful life. CTC designed Holland's network to support both GPON and Active Ethernet services, allowing HBPW flexibility in its open-access model. The architecture anticipated transitions to emerging standards such as XGS-PON and NG-PON2.

The design incorporates redundancy through the backbone network, leveraging existing HBPW fiber and equipment enclosures to create resilient pathways between neighborhood hubs. This distributed approach limits the number of customers affected by any single infrastructure failure.

High fiber strand counts and the ability to deliver services from multiple geographically diverse hubs provide flexibility to serve varying customer needs, from dedicated enterprise services to residential gigabit connections.

CTC's 2021 design ensured the network could expand to serve other communities in the future while maintaining vendor neutrality.

Strategic materials procurement addressed supply chain risk

Global supply disruptions have made materials availability a critical constraint on fiber deployments nationwide. Projects that wait until contractor selection to order materials risk significant delays.

CTC recommended that HBPW procure materials in advance of the design-build contractor procurement process. This guidance, informed by CTC's experience with municipal deployments across the country, enabled HBPW to secure fiber and equipment before market conditions tightened. Our approach helped ensure that project timelines remained under HBPW's control regardless of when contractor selection occurred.

Construction oversight has held contractors to specifications

Design quality means little if construction does not match specifications. Poor installation leads to performance problems, premature failures, and costly repairs.

CTC has maintained a regular presence in Holland during construction to inspect work in progress, review as-built documentation, track expenditures, and manage risk factors. CTC works directly with HBPW's construction contractor to identify and resolve deficiencies and unforeseen challenges.

Our quality assurance process includes field validation of as-built data; our engineers verify pole attachment clearances, confirm slack loop cable lengths and proper bend radius, verify bonding and grounding, and confirm the accuracy of location data for outside plant assets.

A decade of partnership, from feasibility study to citywide construction.

2015

CTC evaluated HBPW's existing fiber infrastructure, developed cost estimates for an expanded fiber-to-the-premises network, and analyzed multiple business and financial models.

2016

Following positive feasibility findings, HBPW engaged CTC to provide engineering services for a downtown pilot deployment covering approximately 4 miles of fiber routes serving 300 potential customers.

2021

CTC updated cost estimates and developed a network concept document to guide community decision-making. This led to a public vote to fund construction of a citywide open-access fiber network.

2022

CTC conducted outreach to material supply vendors and advised on HBPW's pre-construction material procurement to mitigate supply chain hurdles and enable construction to begin as planned.

2023

CTC assisted HBPW in drafting an RFP for the selection of a design-build partner to construct approximately 200 miles of fiber reaching an estimated 16,000 passings. Construction began later that year.

2026

CTC continues to provide owner's representative services and construction oversight for the citywide deployment, which is expected to near completion by the end of December 2026.