

**NOW
UPDATED**

ELECTRICAL CONDUIT BUYER'S GUIDE

**Discover the highest performing
electrical conduit for your project
by application**

There are many types of electrical conduit to choose from for industrial construction projects. There's certainly not a one-size-fits-all solution. The best conduit for a project depends on the application.

Applications vary uniquely in ways such as indoor or outdoor, wet or dry, degree of corrosion, and installation. This guide breaks down applications by project challenges, conduit standards, and price to determine the best electrical conduit for the job. Find out if a project can benefit from an alternative type of electrical conduit.



WHAT TYPE OF ELECTRICAL CONDUIT IS BEST FOR A JOB?

It depends. The best conduit for a project depends on the application. It will also depend on the type of installation (above ground or below ground), building codes, and environmental factors like corrosion, UV exposure, weather, and safety concerns such as fire.

There are many types of conduit – metallic or nonmetallic, rigid or PVC-coated – and each has specific properties that make them ideal for a given situation.

Some of the more common rigid electrical conduit substrates used in industrial construction include:

PVC SCH 40 & SCH 80

PVC conduit is subject to “burn-through” and releases toxic gases when burning.

PVC Considerations:

- > Releases toxins when burning
- > Heavier weight increases man/hours required for installation
- > Not as heat tolerant as other conduit types; in cable dense environments generating heat, conduit can melt

PVC-COATED STEEL

PVC-Coated Steel Considerations:

- > Significantly more costly. Connections are threaded, and conduit is much heavier than fiberglass conduit so installation requires more man/hours
- > Releases toxins when burning
- > Inadequate UV resistance makes PVC-coated steel a poor choice in outdoor environments
- > Low coefficient of friction
- > Requires grounding

GALVANIZED RIGID CONDUIT (GRC)

This conduit is made from steel and provides impact resistance. Used in industrial and commercial applications, it is a long-time industry standard, but very heavy and susceptible to corrosion.

GRC Considerations:

- > Connections are threaded, and conduit is extremely heavy so installation requires more man/hours
- > Prone to corrosion
- > Requires grounding
- > The interior zinc coating makes it not suitable for tunnel installations where UL 2196 is required.

FIBERGLASS CONDUIT (RTRC)

This electrical conduit is lightweight and durable, cost-competitive, and readily available. It is approved for use across many applications including data centers, utilities, and wastewater treatment.

Fiberglass Conduit Considerations:

- > Lightweight
- > No burn-through
- > Fault resistant
- > Low coefficient of friction
- > Excellent corrosion resistance
- > Faster installation per NECA Manual of Labor Rates
- > Heat tolerant; UL Listed to 110 °C



IDENTIFYING THE BEST CONDUIT BY PROJECT

Among the different types of electrical conduit, the electroindustry has identified standards by application. Let's dive deeper into common applications and the electrical conduit that best suits these environments. These include industrial applications in projects such as transportation, data centers, utilities, and wastewater treatment.



BRIDGES

According to the American Society of Civil Engineers' (ASCE) 2021 Infrastructure Report Card, the United States has approximately 617,084 highway bridges, with 42% of them over 50 years old. The organization estimates bridge rehabilitation needs at \$125 billion.

Light weight is important not only for installation, which it makes easier, it also reduces the bridge dead load. Electrical conduit on bridges must be corrosion-resistant to withstand salt on roads as well as handle weather considerations like sun exposure, wind and rain. There is also a need for highly innovative products as these conduits will be used to carry fiber optic cables.

PROJECT CHALLENGES



Installation



Salt on roads



Weathering



Expansion/contraction due to seasonal temperature changes



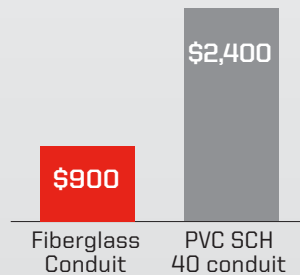
UV degradation

Application Requirements: Light weight, ease of installation, temperature range

Electrical Conduit Typically Considered: PVC

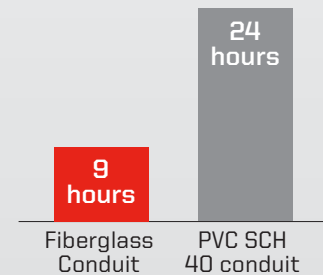
Installation Cost Comparison

(per 100 ft 6" MW Conduit)



Installation Hours

(Per NECA Manual of Labor Units)



Based on prices as of 2/1/25.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit keeps projects on budget, lowers manpower costs, and is lighter and less costly than galvanized rigid steel (GRC) or other rigid metal conduit (RMC) options. It also offers best-in-class field handling due to its light weight, ease of cutting, and integral bell, making it a smart choice for bridges and state DOT (Department of Transportation) projects.



CASE STUDY: Read how Champion Fiberglass helped make a complex installation seamless, safe and on-schedule.

TUNNELS

Infrastructure spending is growing not only for bridges but tunnels too. That means important enhancements to roadway and transit tunnels are in the works. Many times upgrades involve replacement of aging galvanized rigid steel conduit in transit and roadway tunnels.

PROJECT CHALLENGES



Conduit must meet requirements that keep commuters safe



2-hour fire rating



Zero smoke/zero halogen



Expansion/contraction due to seasonal temperature changes



Corrosion



Installation

Application Requirements: Safety, no toxicity

Electrical Conduit Typically Considered: PVC or GRC

Installation Cost Comparison

(per 100 ft 6" MW Conduit)

Fiberglass Conduit	\$900
PVC SCH 40 conduit	\$2,400
GRC conduit	\$4,800
PVC-coated steel	\$6,000

Based on prices as of 2/1/25.

Installation Hours

(Per NECA Manual of Labor Units)

Fiberglass Conduit	9 hours
PVC SCH 40 conduit	24 hours
GRC conduit	48 hours
PVC-coated steel	60 hours

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is lighter and less costly than galvanized rigid steel conduit (GRC), and does not have the toxicity and halogens of PVC SCH 40 or PVC SCH 80. Fiberglass conduit offers a safe alternative that is UL 2196 approved.










CASE STUDY: Read how Champion Fiberglass replaced aging conduit to create a safe tunnel environment for Toronto commuters.



DATA CENTERS

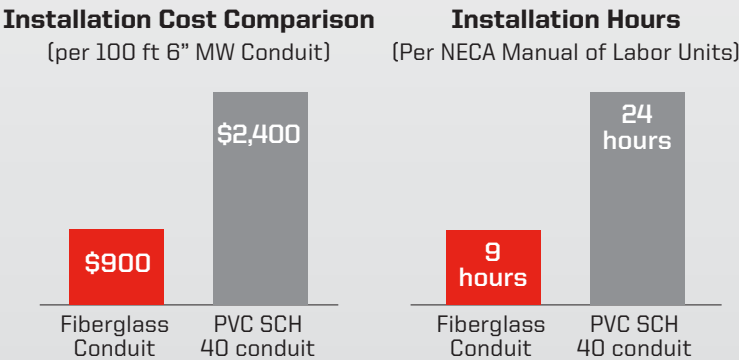
The data center market is expected to grow dramatically in the coming years due to AI advancements. In the US, the data center construction market is expected to reach \$130.93 billion by 2030, according to Grand View Research. Fiberglass conduit elbows and straights are increasingly used in data center projects instead of other types of conduit, like PVC.

PROJECT CHALLENGES

-  Buried installation
-  Wire replacement
-  Wire pulling
-  Conduit repairs due to burn-through
-  Conduit temperature rating
-  Coefficient of friction
-  NECA Labor man/hours
-  Material lead times
-  Installation inefficiencies

Application Requirements: low coefficient of friction, no burn-through elbows

Electrical Conduit Typically Considered: PVC



Based on prices as of 2/1/25.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to pulling lubricants and its low coefficient of friction allows for long pulls with fewer pull boxes. Additionally, no-burn through elbows eliminate elbow repairs.



CASE STUDY: Read how a data center customer experiences a safe, successful installation utilizing prefab.

UTILITIES

The United States power grid delivers electricity across seven million miles of transmission and distribution lines. It is a system comprised of generating plants, wires, transformers, and substations for homes and businesses that are a part of the world's largest economy.

Grid modernization and renewable energy projects are fueling utilities projects. Electrical conduit, used to protect wire and cable from generating facilities through distribution to the end-user, is a crucial piece of the power grid. Utility projects have many of the same project challenges as data centers.

PROJECT CHALLENGES



Buried installation



Wire replacement



Wire pulling



Conduit repairs due to burn-through

Application Requirements: fault resistance, low coefficient of friction, no burn-through elbows

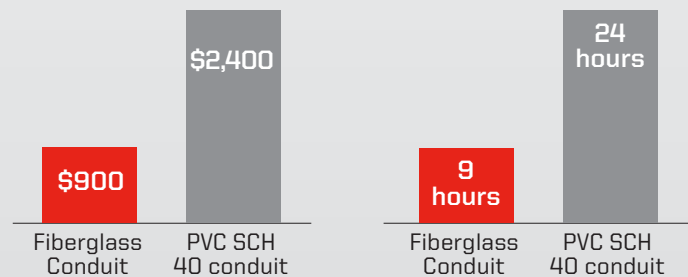
Electrical Conduit Typically Considered: PVC

Installation Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

(Per NECA Manual of Labor Units)



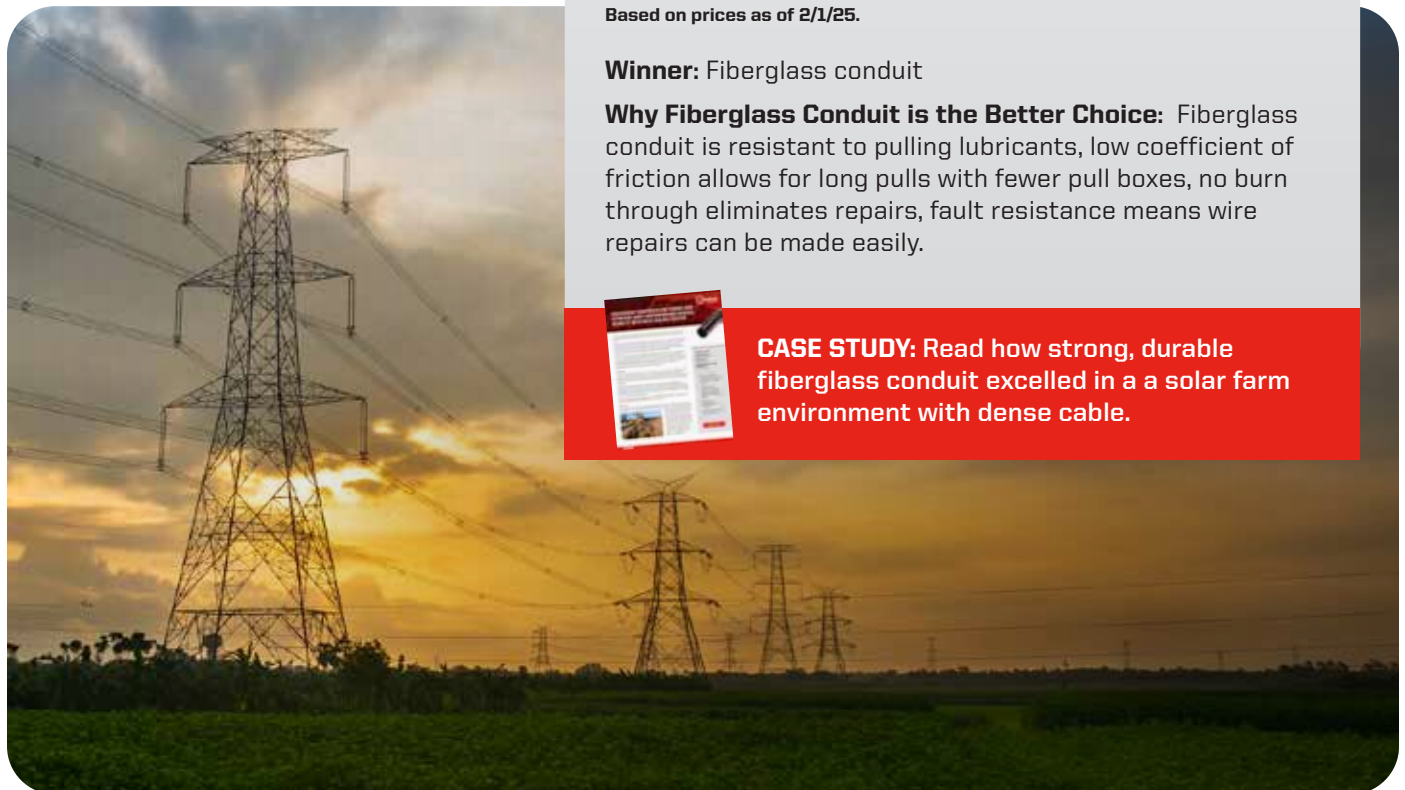
Based on prices as of 2/1/25.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to pulling lubricants, low coefficient of friction allows for long pulls with fewer pull boxes, no burn through eliminates repairs, fault resistance means wire repairs can be made easily.



CASE STUDY: Read how strong, durable fiberglass conduit excelled in a solar farm environment with dense cable.



WASTEWATER TREATMENT PLANTS

In the US, more than 16,000 wastewater treatment plants provide the critical infrastructure required to maintain public health. Few industrial environments are more caustic or damp than wastewater treatment facilities. Harsh chemicals, extreme temperatures, and aging infrastructure require strong, durable conduit systems. At \$36 billion annually, the cost of corrosion related to water and sewer systems is significant.

PROJECT CHALLENGES



Caustic environments prone to corrosion



UV Exposure



Extreme Temperatures

Application Requirements: Ability to withstand corrosion

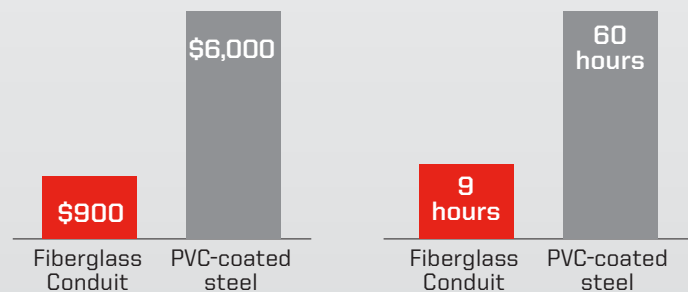
Electrical Conduit Typically Considered: PVC-coated steel

Installation Cost Comparison

(per 100 ft 6" MW Conduit)

Installation Hours

(Per NECA Manual of Labor Units)



Based on prices as of 2/1/25.

Winner: Fiberglass conduit

Why Fiberglass Conduit is the Better Choice: Fiberglass conduit is resistant to many chemicals. It is also UV stable for outdoor environments.



CASE STUDY: Read how Champion Fiberglass created a custom solution with 8000 feet of corrosion-resistant product to replace degrading PVC-coated steel conduit.



INSTALLATION CONSIDERATIONS

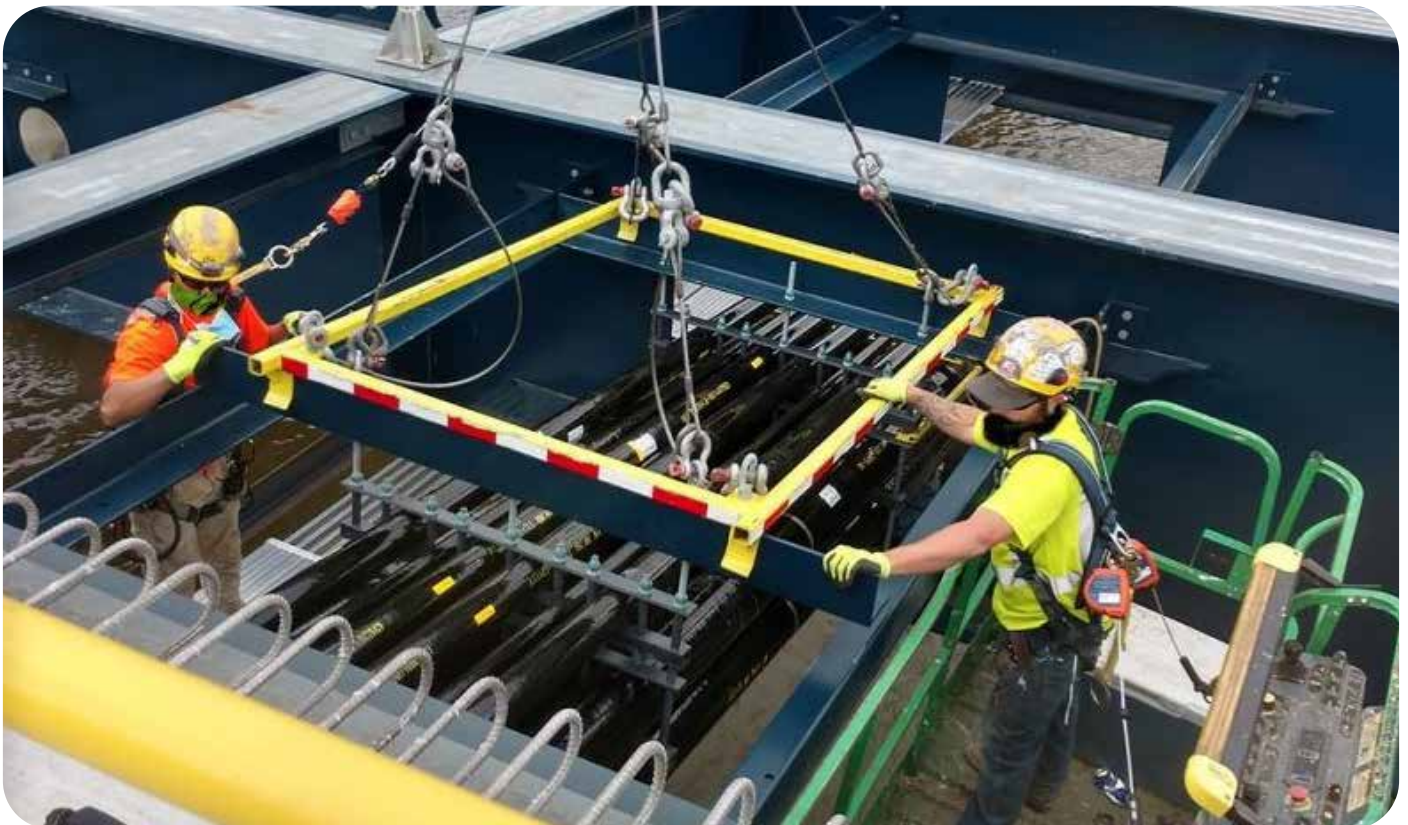


Installation varies by application and project. Common considerations include weight, cutting and bonding procedures, joining systems, and hanger systems. Challenges include conduit availability and project complexity.

Fiberglass conduit offers an [installation solution](#) with ease if cutting, gasket connections, and an integral bell that allows for faster installation. Based on the [NECA Manual of Labor Units](#), most sizes of fiberglass conduit install faster than PVC, galvanized rigid steel, PVC-coated steel, and aluminum providing installation savings.

Additionally, extended support spans translate into more savings. Champion Fiberglass is the only fiberglass (RTRC) manufacturer to offer extended support spacing on a full complement of conduit sizes. The use of fewer struts and hangers increases savings.

Champion Fiberglass conduit is manufactured in Spring, Texas. It is BABA compliant and CSA listed.



CHOOSE THE RIGHT CONDUIT BY TAKING THE NEXT STEPS FOR PROJECT SUCCESS



GET AN ESTIMATE

See how fiberglass conduit compares in price to PVC SCH 40, PVC SCH 80, PVC-coated steel, GRC, EMT and aluminum with your project specs.

[GET AN ESTIMATE](#)

DOWNLOAD BIM/REVIT MODELS

BIM/Revit models help promote efficiency among all teams while collaborating on a project.

[GAIN ACCESS](#)

QUESTIONS?

Got specific questions about how fiberglass conduit can benefit projects?

[CONTACT US](#)

READY TO MOVE FORWARD ON A PROJECT?

The Champion Fiberglass manufacturer's rep network offers experience in helping engineers and contractors solve complex project challenges.

[FIND A REP](#)

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