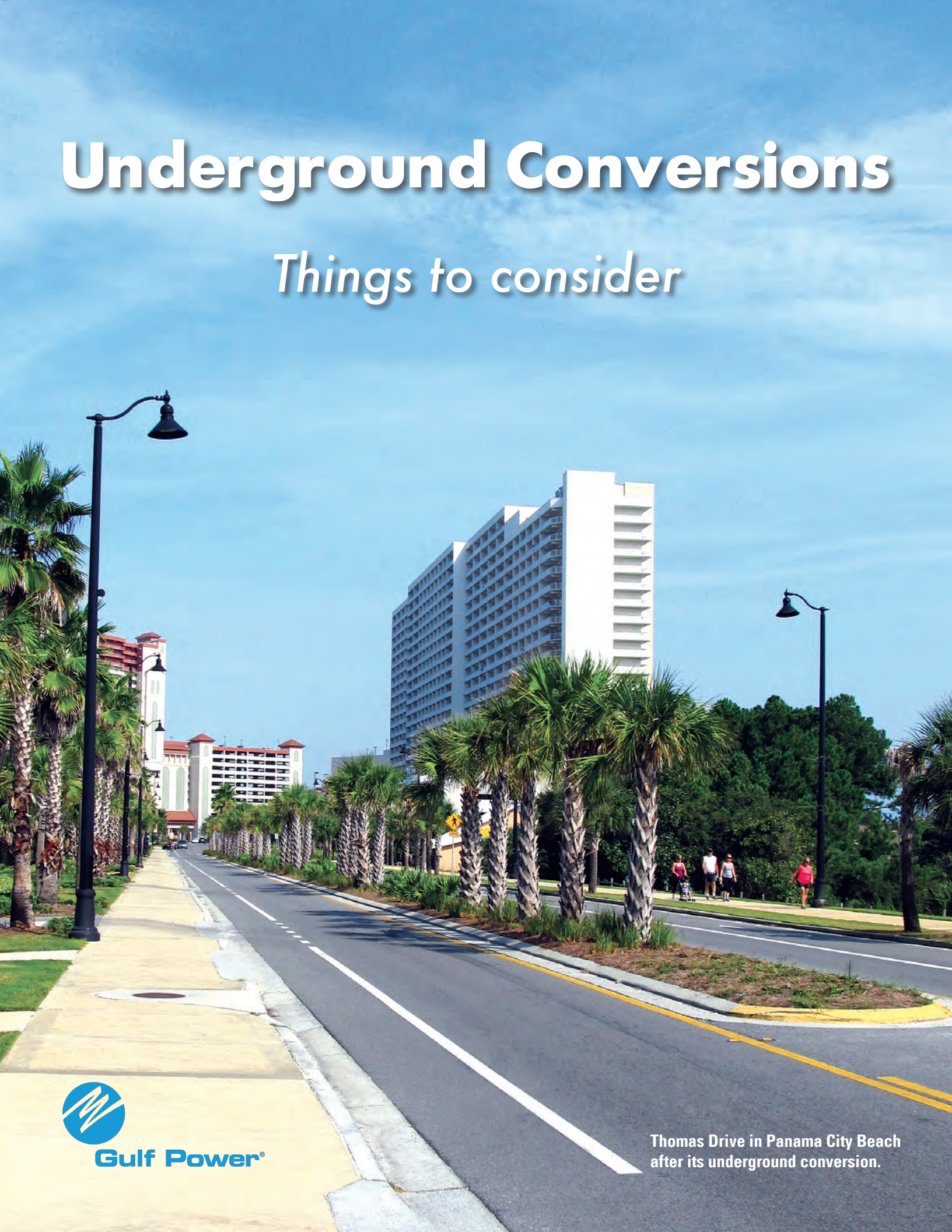
Underground Conversions

Things to consider



Gulf Power®

Thomas Drive in Panama City Beach after its underground conversion.

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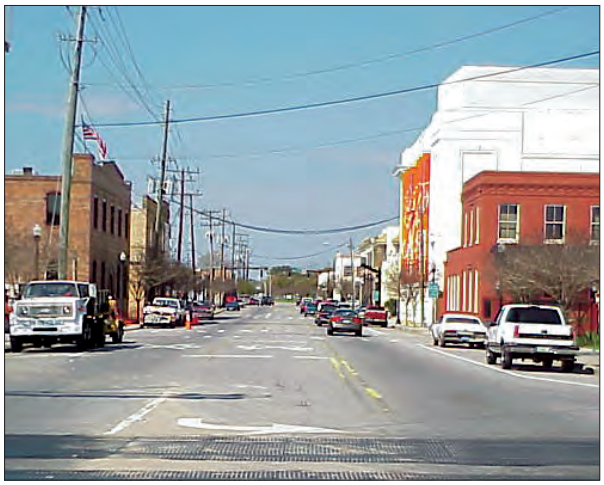
Introduction

In recent years, Gulf Power has received requests for information about installing electric utilities underground. While most of these requests have been for new developments, there has been increased interest in converting overhead electric service to underground.

This handbook is designed for homeowners associations, county governments and municipalities that may be considering converting overhead electric facilities to underground.



Pensacola Main Street with overhead service.

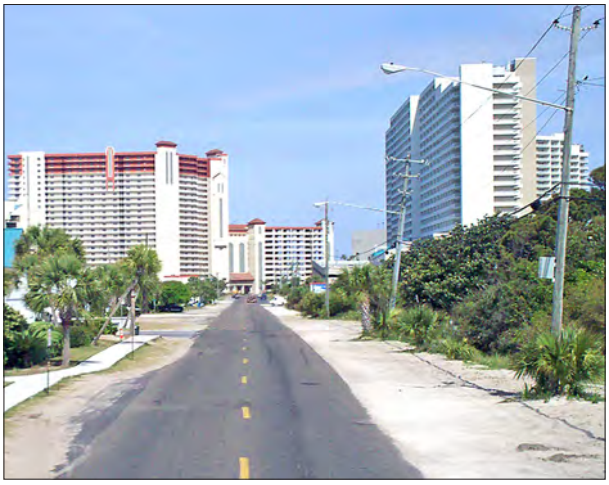
Pensacola Main Street with all utilities installed underground.

Why go underground?

There are two primary reasons for the interest in placing electric utilities underground — aesthetics and reliability.

While most will agree aesthetics are improved when utilities are underground, increased reliability is not guaranteed. While underground systems are less susceptible to limbs, wind and squirrels, underground outages can be longer in duration because of the difficulty in finding the problem and the possibility of having to dig to make repairs. In addition, burying utility lines does not guarantee protection against storms and hurricanes, particularly along our coastal areas where washouts occur.

The information contained in this handbook is designed to provide answers to the most commonly asked questions concerning underground utilities so you can make an informed decision as to whether underground is the right choice for your project. We will review all of the aspects of converting overhead to underground utilities, including costs. We will also offer alternatives and suggest how to get started.



Thomas Drive in Panama City Beach before the underground project began.

Thomas Drive with all utilities installed underground.

What is involved?

Conversion and scope

When converting overhead equipment to an underground system, future capacity for growth must be taken into account. In addition, any future underground development cost is the responsibility of the customer. Poles and overhead lines will need to be converted to cable and conduit. Pole mounted equipment like switches and transformers must be replaced with equivalent equipment suitable for underground installation. Underground utilities such as water and sewer must be considered in the overall design of the conversion.

Because of the complexities of a conversion, the scope of the project must be at least two adjoining blocks or a minimum of 1,000 feet. Shorter distances will be considered if the conversion is at the end of a line.

Changing the customer service entrance

The location where the customer is connected to Gulf Power is referred to as the service entrance.

To accommodate the conversion, the overhead service entrance must be removed and converted. This must be done by a licensed electrician and inspected and approved by local authorities before the customer can be reconnected.

To complete the conversion, the service wire from the main line to the house or business must also be installed underground. All customers with underground service greater than 400 amps are required to provide, own and maintain their own service from Gulf Power facilities. Remember to contact your communication and cable television provider for any overhead to underground conversion cost.

NOTE: All costs associated with an electrician, whether on a residential or commercial conversion, are at the individual customer's expense and in addition to the cost of the main line conversion from overhead to underground. These costs are not included in the estimated cost from Gulf Power.

Overhead service entrance outside a Main Street business.

Underground service entrance upon completion of the Main Street project.

Trenching, repaving and landscaping

Trenching and sometimes digging a pit and boring under a road are necessary to install underground lines. If roads, driveways or sidewalks are involved in trenching, the removal and replacement of concrete or asphalt will be an added expense. Trenching may affect existing landscaping. The project will likely involve relocating, converting or burying telephone and cablevision lines. The location of existing water, sewer, storm sewer and natural gas lines can also impact the location of any new trenches and add to the cost of the project.

NOTE: Gulf Power can coordinate repaving and landscaping efforts, incorporating costs into the conversion estimate if requested. If not, these costs are in addition to the cost of the main line conversion and are the customer's responsibility. Streetscape or road improvement contractors are typically on site with digging equipment during the project.

Lower costs and increased project control may be realized through these onsite resources. With so many utilities involved, all efforts should be planned, timed and coordinated through a single project coordinator.

Pensacola Main Street during construction. Optional red tinted concrete marks the location of underground utilities.

Easements

Converting the overhead equipment to underground facilities often requires securing easements or purchasing property on which to place the equipment.

All easements must be secured before the start of the project. It is recommended all equipment and conductors be placed on private property with easements. This protects your project from future construction project impacts (such as road widening).

The utility easement for Pensacola's Main Street conversion is along the curb in the parking lane.

A concrete vault for switch gear requires larger easements.

Other considerations

Much of Northwest Florida has a rich history. Archaeological considerations may slow underground projects in certain historical districts.

Recently, many conversions have been requested along the Gulf of Mexico coastline that require stainless steel equipment to reduce corrosion.

Project costs may be reduced if a customer can perform some of the required work including, but not limited to, clearing the trench route and trenching and installing the conduit.

While this is not an exhaustive list of considerations, it's a representation of the important issues beyond direct costs associated with a large project. It's important to consider these items during the initial planning stages.

We have provided a list of contact numbers for underground projects from telephone and cablevision companies operating in Gulf Power's service area. It may be necessary to contact personnel from water, sewer, gas and other utilities.

Non-typical construction because of coastal terrain. Cabinet bases are secured with limerock in sandy, exposed conditions.

(Note: vegetation should always be located away from equipment for ventilation and for identification.)

Lines may be attached to bridges in conduit to address environmental issues if all necessary permits are obtained.

Padmount transformer, light pole, cable and telephone terminals in one location indicate a well-coordinated project. It is important, as shown here, to avoid plantings around utility enclosures in case repairs are needed and to ensure proper ventilation.

Street lights

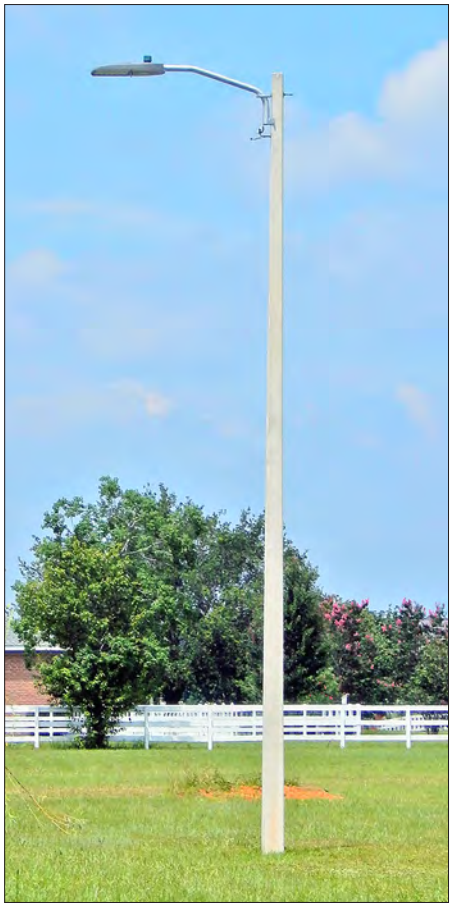
Gulf Power offers a variety of lighting fixtures and poles. Street and area lighting is a simple and cost-effective service that adds value to your neighborhood and business. While a convenient and cost-saving method is to install lights on the existing poles that make up the overhead electrical system, a conversion to an underground system necessitates the removal of the poles. A lighting system can be designed to illuminate the desired area or roadway using dedicated lighting poles. Additional expenses associated with street and area lighting should be considered in the conversion estimate. There are several examples of lighting options pictured on this page.

Our lighting team can design a system tailored to your specific situation. We can provide a free lighting analysis and help you determine what type of lighting your business needs.

In addition, you can be assured that the initial installation and ongoing maintenance will be done right and on time.

The Warp 9 LED fixture mounted on a 35-foot aluminum tenon top pole.

Popular in residential applications, the Acorn fixture is on the 13-foot decorative pole.



The Autobahn LED streetlight mounted on a 30-foot concrete pole.

What about the costs?

Once the intent and the scope of the project have been determined, contact Gulf Power's local Marketing department. Through this call, Gulf Power's Engineering department will also become involved. After we meet with your organization and visit the site, you will be given an initial non-binding cost estimate. This order of magnitude estimate should help your agency or organization decide if the project is feasible or within your budget constraints.

These estimates are based on cost comparisons between overhead and underground materials as shown on the following pages. Many factors influence the cost of any conversion (landscaping, lighting, sidewalks, line sizes and roadways) making each project unique.

While overhead service is typically free and underground service will be provided at a cost representing the difference between overhead and underground, there are two main cost factors in a conversion:

1) If the initial non-binding cost estimate is in line with the intent and budget of the project, you may request a "binding" cost estimate.

A. This involves payment of a non-refundable deposit and completion of the application for "Underground Cost Estimate."

B. The deposit amount covers the engineering cost for preparing the requested estimates.

C. Deposit funds will be credited toward the construction if a contractual agreement is reached within 180 days.

2) The amount to be paid by the applicant, prior to the installation of underground facilities, will be calculated based on the following:

A. The cost of constructing the new underground facilities, including the cost of an underground service entrance to the source side of the meter (for those with 400A mains and less).

B. A credit for the estimated construction cost to build the existing overhead facilities at present cost, including the service drops to the customer-owned service entrances.

C. The cost of removing the existing overhead facilities.

D. The cost for the estimated net book value of any existing facilities to be removed.

E. A credit for the salvage value of the removed facilities.

F. The cost difference in operating an underground system verses an overhead system over its expected lifespan.

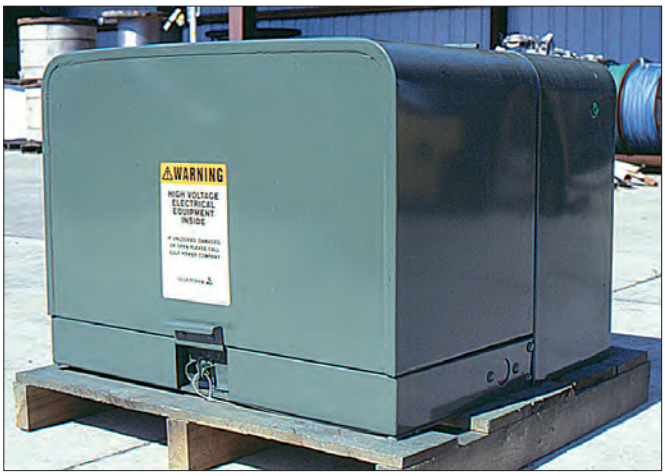
Comparisons between underground and overhead equipment

Note: These prices are subject to change. They are provided for material comparison purposes only.

Single-phase transformers

Single-phase overhead

Mild Steel 37.5 KVA transformer - $1,017
Stainless Steel 37.5 KVA transformer - $1,441



Equivalent single-phase underground

Mild Steel 37.5 KVA transformer - $1,892
Stainless Steel 37.5 KVA transformer $2,700

Three-phase transformers

Three-phase overhead

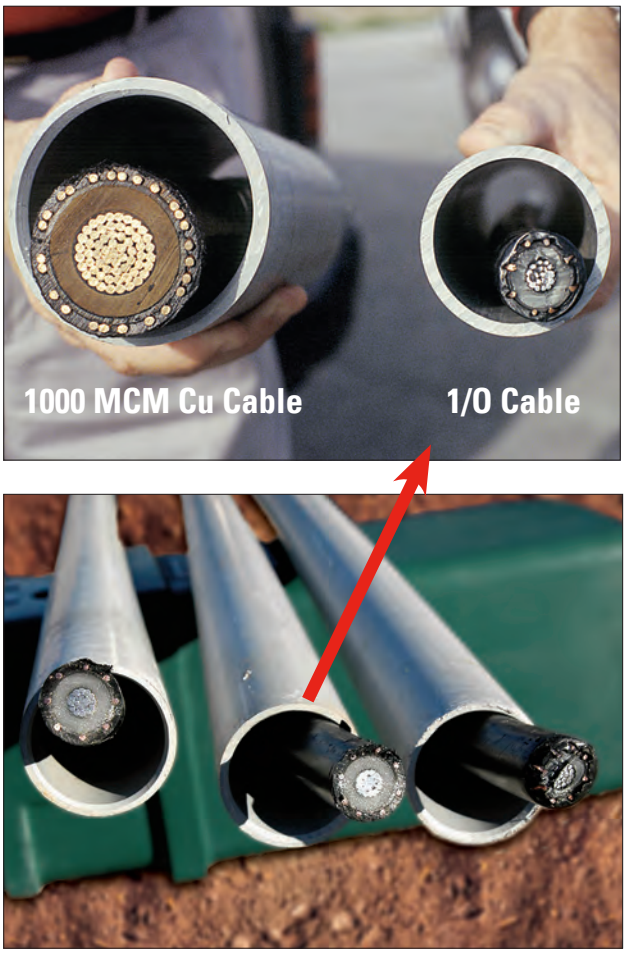
Mild Steel 112.5 KVA WYE transformer bank - $5,515
Stainless Steel 112.5 WYE transformer bank - $6,934

Equivalent three-phase underground

Mild Steel 112.5 KVA WYE transformer - $7,629
Stainless Steel 112.5 WYE transformer - $11,172

Standard feeder construction

Overhead three-phase conductor. 1000 feet of 1/0 AAAC overhead conductor with neutral - $700
(no pole or hardware)



Equivalent underground three-phase cable.
1000 feet of 1/0 underground cable - $3,150
(no trenching or conduit)

Mainline feeder construction

Overhead three-phase 795 AAC construction. 1000 feet of 795 AAC overhead conductor with neutral - $4,500 (no poles or hardware)

Four feeders near a substation require a large construction footprint

Duct work for equivalent 1000' of 1000 KCM copper conductor (1 circut) underground with neutral - $105,000 (no duct work cost included)

Line protecting equipment

Overhead three-phase recloser - $24,400
(no pole)

Equivalent underground three-phase switch - $80,400
(no base)

Alternatives to underground conversion

If overhead to underground conversion isn't feasible there may be other alternatives. Costs associated with the selected alternative depend on the scope of the project.

Placing the overhead lines on concrete poles instead of wooden poles may make it more aesthetically pleasing. However, the more visible lines are the large, black telephone and cable lines. They are more visible because they contain more lines, are usually larger in diameter and are placed lower on the pole. An example of concrete pole line construction can be found on Okaloosa Island in Fort Walton Beach and in Sandestin.

Another option is to relocated a pole line to a nearby street as was done on the Gregory Street Redevelopment Project in Pensacola.

The beautification was accomplished through a city ordinance requiring any new businesses to wire their service entrances from a nearby street. This ordinance negated the requirement for electric lines along a primary city corridor. Once all businesses were serviced from the nearby street, the lines and poles along the main corridor were removed.

Agreements with telephone and cablevision companies were also required for this project. Projects of this type must be designed to allow for complete accessibility to all facilities by Gulf Power.

Another alternative is the combination of an overhead "backbone" with all other utilities underground. This may be the most practical concept in new developments. The "backbone" conductors remain on the main roadway using concrete or wooden poles and dip down at each subdivision or commercial establishment. The rest of the development is served underground from these points.

The final alternative to a complete underground conversion is the "no crossover" method. This entails construction of a pole line on each side of the road with limited or no aerial crossings in the project limits. This method lines both sides of the roadway with poles and lines but presents an "open" view overhead.

This wooden pole carries electric, cable television and telephone lines as well as an electric transformer and telephone junction box and platform.

Concrete pole line on Okaloosa Island in Fort Walton Beach.

Overhead feeder relocated to serve the business district on Gregory Street from a back street in Pensacola.

Mainline feeder system with no overhead crossovers on Pensacola Beach.

How to get started

Effective communication ensures that any underground utility project moves along efficiently. The first step in getting started is to identify a point of contact with each utility involved. Likewise, the municipality, developer and homeowners association should designate one individual or committee to be responsible for communication and coordination of events. This important step will ensure that everything from securing bids to coordination of the actual work will be accomplished as timely and efficiently as possible.

Once the appropriate contacts are identified, a series of meetings should be scheduled with all necessary parties. This will be particularly helpful in coordinating the required site work and could provide a customer with potential cost savings for trenching and other required activities.

Depending on the magnitude of the project, the engineering design stage could take two to six months. This process includes analyzing electrical requirements, pricing the project and securing bids from qualified contractors.

Since materials may be unique to the conversion project, they are not ordered until the project has been approved by all concerned parties. The delivery of material can take up to 16 weeks depending upon the type and quantity of the materials ordered.

Financing options

If your organization decides that an overhead to underground conversion is in your best interest, a Gulf Power representative will meet with your organization to discuss payment and financing options. Potential financing methods may include bond issuance, tax increments, special assessments and municipal service benefit or taxing units. Money may also be available through redevelopment grants. Generally, these methods would provide the least expensive funds.

Note: Financial arrangements and contractual agreements including easements must be finalized and received by Gulf Power before materials are ordered and construction begins.

Summary

We hope you have found this handbook useful in planning your underground project.

We believe the best way to help you meet your goals is through open communications and teamwork. Our commitment is to be a positive influence in the communities we serve.

If you have any questions or comments, please contact any local Gulf Power Marketing or Engineering representative.

Gulf Power contacts

For engineering questions, please contact Gulf Power Customer Service at 1-800-225-5797. For Marketing questions, please contact Gulf Power Marketing at 1-877-655-4001

Or visit our website at MyGulfPower.com.

Other contacts

ATT	(850) 436-1485	Escambia, Santa Rosa and Bay Counties
Bright House Network, LLC	(850) 554-8822	Chipley, DeFuniak Springs, Cantonment, Pensacola
CenturyLink	(850) 664-3608	Okaloosa and Bay Counties
City of Valparaiso	(850) 729-5402	Valparaiso
Comcast	(850) 770-8056	Bay County
Cox Communications	(850) 314-8163	Escambia and Okaloosa Counties
Fairpoint Communications	(850) 229-7344	Walton and Okaloosa Counties
Windstream	(850) 445-5880	Northwest Florida
WOW	(850) 566-5649	Bay County
Level 3	(850) 202-1575 and (251) 978-5280	Northwest Florida
Mediacom	(850) 934-7700	Bay, Santa Rosa and Walton Counties
Southern Light	(850) 259-0807	Northwest Florida
Fibercast	(850) 835-0000	City of Springfield

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