Palm Beach Shores, Florida

Undergrounding Overhead Power & Communications Utilities

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Feasibility Study

For

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Purpose of this Study

Over the past several years, the Town of Palm Beach Shores (Town) and various residents have seen a need to become more informed on the option of undergrounding the overhead power and communications lines within the Town and the associated potential to improve reliability, safety, and aesthetics of these service facilities. The weather events of 2004 and 2005 as well as others across the country have once again reinforced the need for communities to seek ways to better secure their lives and property.

The current economic climate has kept interest rates low, offering the opportunity to make infrastructure improvements at significantly lower costs than previously possible. Florida Power and Light (FPL) will currently provide a 25% reduction in the charges they would normally impose on the Town for undergrounding the overhead lines. In addition, the opportunity for cost reductions from FPL resulting from the impending overhead line hardening program creates an additional motivation for Town's to underground the utilities. These factors make this a pivotal point to move forward with undergrounding if the Town desires to do so. The project costs will increase dramatically after the FPL hardening project is completed. Interest rates and contractor costs will also increase as the economy improves.

For the residents of Palm Beach Shores to evaluate the undertaking of such a project, they would require a better understanding of the options, benefits and costs of overhead utility undergrounding. To assist in educating the residents, the Town has undertaken this study.

Executive Summary

A rapidly changing world focused on a continuously increasing dependence on reliable electric power and communications make it critical that we keep our eyes open for opportunities to move from the old technology to the new technologies. Online Banking, Online Shopping, Social and Professional Networking, Email Communications, and many other similar functions are becoming increasingly important in our daily lives. Opportunities for credits such as the 25% GAF (Governmental Adjustment Factor) credits offered by FPL, or opportunities offered by reduced construction costs during economic recessions, are just a few of those being watched today. It is not a question of moving ahead or not, but a question of capitalizing on the opportunities to move ahead focusing on minimizing the cost and maximizing the benefits.

Many communities such as Daytona Beach, Sewall's Point, Jupiter Island, Jupiter Inlet Colony, Jupiter, Palm Beach, Gulf Stream, Hollywood, Fort Lauderdale, Naples, Longboat Key, Pompano Beach, and Miami Beach are undergrounding overhead facilities. Initially the community focus was on improving the electrical facilities for reliability, aesthetics, and safety. As the information age has exploded, communities are becoming equally interested in the communications facilities for reduced costs and robust connectivity. The days of satisfaction with old copper technology and wired phones are quickly fading as residents and businesses become more and more dependent on the internet and mobile communications solutions. This trend will soon accelerate as the information technology community moves into cloud computing for daily bill paying, health monitoring, and the online procurement of items of all types.

The new underground Comcast communications facilities typically incorporate the new Fiber Optic technology which is capable of delivering reliable broadband, television, and telephone communications services. AT&T is also looking at Fiber Optics as well as wireless solutions to replace old copper lines.

Town residents are considering the option of undergrounding the overhead electric and communications utility lines. FPL and many Florida governmental agencies promote underground utilities. The benefits of undergrounding overhead utility facilities are typically characterized as improvements in reliability, safety, and aesthetics. Underground facilities eliminate many safety issues that result from overhead line equipment failures. Downed power lines present a danger of electrocution as well as blocking ingress and egress of emergency response vehicles. Underground facilities are less susceptible to windstorm damage. And lastly, underground facilities are generally less offensive aesthetically as compared to overhead lines.

After reviewing the existing facilities, it is our professional opinion that the cost to replace the overhead power, telephone, and cable television facilities within the Town with underground facilities would be approximately $4.3 - 5.2 Million. This opinion includes a 20% contingency which can be seen in the detailed data at the end of this report. Florida Power & Light Company currently requires that all underground services originate from a location accessible to their maintenance vehicles. This typically means that all underground facilities will now be required to be located along the street, and run to the electric meter location with no access points in between. This policy will require that all existing overhead services and existing underground services not originating along the street will have to be replaced in an undergrounding project. Service lines would also extend from the street to the current electric meter location. All utility lines located along rear property lines, or otherwise not located along the street, will typically have to be relocated to the street for vehicle access.

In addressing the aesthetic impact, this study provides for landscaping around FPL cabinets with plantings compatible with the existing landscaping. Typically, an undergrounding project of this scope would take approximately four years to complete from the initial survey and engineering design work to final removal of the overhead poles and wires. Existing sections of underground facilities suitable for reuse would be incorporated

into the new underground system provided that the cost to reuse was less than the cost to replace.

The hurricanes of 2004 and 2005 resulted in the promotion of underground electric power facilities, and increased tropical wind resistance requirements. Currently, FPL is providing Credits up to 25% of the otherwise required contribution in Aid of Construction as a means of promoting the undergrounding FPL of electrical facilities. This credit is typically referred to as the GAF or Avoided Storm Restoration Cost credit. The regulations filed with the Florida Public Service Commission (FPSC) require FPL to charge the Town with the in-place cost of the existing overhead electric facilities which will be removed. Currently the facilities in Palm Beach Shores are old and highly depreciated which results in a low cost to the Town. If the Town waits until after completion of the FPL Hardening Project, the overhead line facilities will be new and that would result in a significantly higher cost to the Town if undergrounding is undertaken. As an additional benefit, FPL will be required to provide the Town with a credit in the amount of the estimated cost to build a new equivalent overhead system. Such a new system would be engineered as a hardened facility resulting in a greater credit than previously available. Hardened lines typically have more poles and the poles are significantly larger. FPL has reported that they are holding back on the hardening work in Palm Beach Shores at this time, but cannot hold back indefinitely. The FPSC has mandated the hardening project with specific completion expectations.

FPL is now installing smaller underground switching equipment capable of withstanding emersion in water. Both FPL underground transformers and switches today are using stainless steel cabinets to better withstand the corrosive coastal salt environment.

Study Scope

This study focuses on the undergrounding of the existing overhead utility electric power, telephone, and cable television line facilities with equivalent underground facilities. This study provides cost opinions for replacement of overhead utility facilities with underground facilities based on current utility standard construction practices and configurations. This study covers the facilities located within the town limits of the Town of Palm Beach Shores.

The study assumes that the engineering will include an engineer representing the interest of the community and that the construction of FPL underground facilities will be executed by the Town, and not by FPL. These items are key to securing lowest costs and maximizing community benefits. FPL assumes no responsibility for complying with the community's schedules as their priority is maintaining service to existing electric customers and they will attend to that work ahead of any undergrounding work. In addition, FPL does not assume any responsibility for restoring landscape or hardscape damaged during the construction when such damage was associated with required work. FPL does not provide any conduits for communications companies or service work for any non- residential services that need to be placed underground.

Assumptions:

1. The construction will be executed in one phase.
2. The Town will engage contractors to install all of the FPL underground facilities and to transfer all the existing electric service customers to the new underground system.
3. The Town's contractor will install all the conduits required by the communications companies.
4. Underground utility cables will be installed within street right-of-way (ROW) where beneficial via the FPL ROW Agreement.
5. Easements will be used for above grade FPL equipment where possible.

Legal and Surveying

Typical requirements for legal services include routine form and content reviews of such documents as request for proposals, request for qualifications, surveying contracts, landscaping contracts, construction contracts, utility company contracts and agreements, and easement instruments. These services are included in the opinion of costs provided in this study.

Undergrounding Projects require a significant surveying effort. In the initial stages, a survey is required to document all property lines, ownership lines, right-of-way lines, utilities, sidewalks, pavement areas, driveways, structures, buildings, obstructions, trees, fences, etc. located within a corridor along the conceptual underground route. Should easements be required, surveyors typically prepare easement drawings and legal descriptions. Additional survey services are required to provide construction staking at the beginning of the underground construction phase. As construction progresses, surveyors must gather as-constructed field data to document the actual location of the installed underground facilities for Florida Power & Light company. When an FPL "ROW Agreement" is utilized, surveyors will typically provide a final as-constructed version of the construction drawing and a legal description of the ROW tract to be utilized. The costs for these services as described herein are included in this study.

Easements and Right-of-Ways

In the past Florida Power & Light Company would not install underground facilities within road rights-of-way except to cross a road to reach an easement on the other side. All FPL underground facilities were required to be placed within an easement except service laterals serving the property within which they were placed. As a result of the problems with the tropical storms of 2004 and 2005, FPL revised their policies to allow such installations within street right-of-ways. The authority having or sharing jurisdiction over the rights-of-way must agree to reimburse Florida Power & Light for relocation costs when such relocations are being requested by the authorities having jurisdiction. Developer requests and other third party requests for FPL relocations are not the Town's responsibility. This "ROW AGREEMENT" option enabled many communities to underground Florida Power & Light Company facilities with minimal requirements for easements saving both time and money.

A survey of the Town will be required to determine exactly where the travel lanes, property boundaries, sidewalks, and existing utility facilities are located. Title searches will be required to identify existing easements and to aid in describing any new easements that may be required. However, from our site observations, we found no conditions that would preclude utility undergrounding due to a lack of or inability to secure easements or a right-of-way via an "ROW AGREEMENT". There are typically no costs associated with the acquisition of easements and right-of-ways other than Engineering specifications, legal reviews and surveyor services. This study does not include any costs to purchase easements as we have never been required to purchase easements for any project.

Street Lighting

Generally, this project is not planning to replace street lights. A review of the Town has located several FPL utility pole mounted street lights along Lake Drive and South Ocean Avenue. However, the Town has a uniform installation of Town owned street lights throughout the Town and the removal of these existing FPL lights will not result in an adverse impact on the Town's lighting plan. All intersections currently have Town owned post top Acorn type fixtures. In addition, there is typically a fixture located mid-block on all north-south streets, and fixtures at uniform intervals along all east-west streets.

Landscaping

In as much as "Improving Aesthetics" is a factor in undergrounding overhead utilities, it is common that communities wish to place plantings around equipment such as FPL transformers, FPL switch cabinets, telephone terminal boxes, and cable television pedestals. The degree to which a given community desires to install such landscaping to hide utility ground mounted equipment varies from community to community. Landscaping plans are typically developed during the construction design process with plantings designed to match the existing surrounding landscaping. A landscape architect may be used to prepare a detailed list of required plants including such details as size, grade, species, and spacing. Such specificity ensures landscaping vendor's bids are for comparable services and the desired results are achieved. This study will assume the landscaping requirements to be typical based on our experience with landscaping primarily being placed around Florida Power & Light Company pad-mounted transformers, switch cabinets, and capacitor cabinets.

In some cases, additional landscaping will be required to remedy damage incurred during the removal of the overhead poles and wires after the underground facilities have been installed. This is typically minimal and handled on a case by case basis. This study will not include costs for landscape restoration required due to damage resulting from overhead facility removals as these costs are typically minimal and not predictable.

Safety

In as much as "Improving Safety" is a concern for every community, live electric lines on the ground can cause property damage, injury or death. Underground high voltage electric lines typically include concentric ground wires which provide a direct path to ground and activate protection devices that de-energize the lines. Energized overhead lines lying on the ground are unfortunately a common occurrence. Down power lines or communications lines can prevent emergency vehicles for having access. In as much as the untrained public cannot typically tell the difference between a low voltage communications line and an electric power line, it is usually assumed that a down line is dangerous and precaution is warranted.

Reliability

Recent storms that hit the northeast coast brought questions from national news network broadcasters as to why the power was not underground. Comments came back that it was too expensive to place the facilities underground, and it takes too long to repair the underground lines when they fail, and that water would be a problem. It should be noted that the cry for underground facilities comes from observations that areas with underground facilities suffer much less damage and are restored significantly faster than overhead areas. New sealed ground mounted switch cabinets recently adopted by FPL are stainless steel and are sealed switches of a type that is capable of operating in wet conditions and being installed at ground level or below grade. FPL has adopted a policy of looping underground cables so that power can be restored when a cable fails simply by switching actions. The failed cable can then be repaired at a later time. Pad mounted transformers in coastal areas have also been converted to the stainless steel type.

Aesthetics

Unsightly overhead lines are a thing of the past in undergrounded areas. Tree trimming by the utilities often results in a very unsightly appearance as crews use such methods as “V” Cutting to promote vegetation growth away from their lines. “V” Cutting, Side Trimming, and Topping of trees almost always creates an poor appearance. As overhead lines are removed, vegetation is allowed to resume a natural and more attractive appearance.

Construction

Typically, all new underground wire and cable is installed inside underground conduit today. The most frequently used method employed to install the underground conduit in existing developed neighborhoods is the Horizontal Directional Boring Method. This method is particularly desirable where you have extensive landscaping and hardscape such as pavers. It also results in much less impact on traffic flows. Costs for this type installation have dropped drastically as machine costs and competition have improved. However, there are still some spots where working by hand with old fashion shovels is the best.

New padmounted transformers utilize stainless steel cabinets which offer much better useful life characteristics. In addition, FPL now offers stainless steel sealed switch cabinets that are operable in rising water levels. These switches operate inside sealed gas filled chambers.

Opinion of Cost to Underground the Overhead Utilities

The following is our professional opinion as to the likely cost for undergrounding the overhead FPL and Communications facilities within the Town of Palm Beach Shores. This opinion of cost does not include installing any replacement street lighting facilities or the installation of any Town owned fiber optic communications facilities.

Component	Cost
Survey Costs	$ 74,787.61
Legal Costs	$ 53,419.72
Project Management/Administration Costs	$ 160,259.16
Engineering Services Costs	$ 142,452.59
Utility Conversion Costs (FPL, AT&T, & Comcast)	$3,901,442.43
Site Landscape Restoration Costs	$ 26,675.00
Construction Contingency (20%)	$ 871,807.30
Miscellaneous Other Costs (Feasibility Study)	$ 10,000.00
Total Opinion of Cost	$5,240,843.81

Note: This opinion of cost represents our professional opinion based on unit costs data from similar projects and our experience. This opinion does not represent an exact cost for this project and should not be considered as such.

Conclusion

In light of the impending FPL hardening Project, we feel that Palm Beach Shores has a unique opportunity to enjoy financial benefits associated with executing this project at this time. Based on our experience, we believe that the Palm Beach Shores Underground Utilities Project as envisioned is technologically feasible and the site characteristics can support such a project from an engineering and construction perspective. In addition, our opinion of the costs is consistent with our experiences elsewhere in Florida and there appear to be no extraordinary cost elements.

In our view, the primary challenges facing the Palm Beach Shores Undergrounding Project in order of importance are obtaining property owner support, managing expectations, and obtaining equipment easements. The property owner support issue relates directly to the wide mix of property owners relative to their ability and willingness to participate. Managing expectations relates again to the projects duration and community disruption during construction. Easements will be challenging as property is limited and highly valued.

We believe that the Town of Palm Beach Shores has demonstrated a realistic understanding of the process, issues and variables involved in executing such a project.