Final Report

CONVERSION OF AERIAL to UNDERGROUND UTILITIES ANALYSIS

Town of Palm Beach
Palm Beach, FL

November 2006

R·W·BECK

Town of Palm Beach
Palm Beach, Florida

CONVERSION OF AERIAL TO UNDERGROUND UTILITIES ANALYSIS

I hereby certify that this Conversion of Aerial to Underground Utilities Analysis was prepared by me or under my direct supervision and that we are duly registered professional engineers under the laws of the State of Florida.

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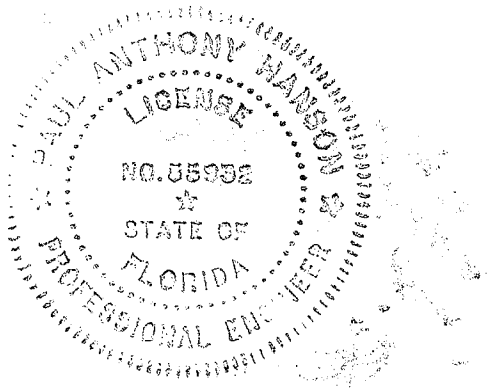

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R. W. BECK, INC.
CONVERSION OF AERIAL to UNDERGROUND UTILITIES ANALYSIS
Town of Palm Beach

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Table ES-1
Underground Conversion Cost Summary

	Total Cost (w/o Joint Trenching)	Total Cost (with Joint Trenching)
FPL (CIAC)	$49,878,300	$51,336,400
BellSouth	$6,001,000	$5,400,000
Comcast	$3,970,800	$3,578,400
Total	$59,850,100	$60,314,800

The results of the options appear to be counter intuitive, since the joint use trench cost is higher than the separate trench option. However the justification or explanation of the relationship is:

- The joint trench option assumes a pathway will be provided on all backbone and tap circuit routes for ultimate use and conversion. The actual footage of the existing underground telephone plan is about 60% of the proposed route. Therefore there is excess conduit included in the joint trenching option.
- The installation method of the joint trench would utilize a different installed depth than the separated routes.
- The joint trench allowance stated by the cable company seems to understate the benefit.
- The completed system would provide a more efficient use of the space or "right-of-way".
- The public should be exposed to less construction time with the joint trench approach.

The cost estimate also includes expenses which are the responsibility of the Town, but would not be direct payments to the Utilities. Project Management and owner's expenses have been included and are approximately $5.9 million of the total estimate for the joint trenching option. As discussed in the report, these items are necessary to coordinate a complex project and protect the Towns interest.

Details of the cost estimate are shown in Section 3.

Introduction

The Town of Palm Beach Florida (Town) has been evaluating the potential benefits of a conversion of all overhead electrical and communications facilities within the city limits to underground, due to aesthetics and issues concerning reliability. The affected utilities would be Florida Power and Light (FPL), BellSouth and Comcast (collectively as the Utilities). Several studies have evaluated the related impacts and cost of such projects. These studies have been performed by internal as well as external entities. The recent hurricanes in Florida have further motivated such analyses, which are now a state-wide subject with discussions by the local utilities as well as the Public Service Commission. The Town is currently slated to have a referendum vote to determine citizens' interest and desire to initiate a requirement to underground all utilities within the city limits.

The Town has requested R. W. Beck, Inc. (R. W. Beck) to perform a high level review of the current cost estimates the Town is utilizing in its analysis (Project). This review evaluates the electric, telecommunications and cable television utilities (Utilities) in the area.

Findings

The analysis contained in this report finds that the costs of converting the existing overhead networks to underground of the Utilities in Palm Beach to be roughly $60.3 million. These costs may be reduced by carefully coordinating the FPL conversion and replacement of existing telephone and Comcast overhead cable facilities. The cost was developed with two construction scenarios; the first was based on each utility performing individual trenching or boring functions and the second option is based on one entity performing the trenching or boring and conduit installation for the main line facilities. These costs are summarized in the following table for each Utility, with and without joint trenching:

This is not Palm Beach's first attempt to obtain an estimate of the cost of converting its overhead Utilities to underground. Prior attempts have produced different results, which are likely based on different assumptions. The following table summarizes cost estimates to date:

Table ES-2
Cost Comparison

	Cost	Notes
Palm Beach	$62,000,000	Based on extrapolation from pilot project cost
JLSD	$53,000,000	2004 Estimate- does not include FPL CIAC formula
R. W. Beck	$60,314,800	Includes CIAC formula, Telecomm, Project Management and owner's expenses
FPL (Electric Only)	$32,000,000	Does not include Telecomm

Additionally, the decision and ultimate negotiations with the Utilities should reflect the current regulation amendments under consideration. Current potential impact issues include:

- FPL's 25% allowance for conversion projects to municipals. This allowance is a product of the state-wide initiative to improve reliability to the Florida electric Grid. FPL is proposing this credit to foster a joint effort of the municipals and utility to improve the service to the area. Based on the estimate enclosed this could amount to approximately $12 Million reduction in the overall cost of the project.
- FPL's current decision to change the design standards for distribution facilities. FPL is proposing designing its new distribution facilities to meet the NESC extreme wind criteria. If applied to the overhead credit or the conversion formula, the total cost to the Town should be reduced. Based on the enclosed estimate this could reduce the overall cost of the project by $950,650.

Evaluation Material

The analysis conducted in this Project included the following data sources:

- Site visit to observe the condition, location and type of overhead facilities
- Local interview with the Town of Palm Beach's Deputy Town Manager
- Previous studies performed by JLSD Consulting Engineers
- FPL system maps provided August 2004
- FPL cost estimate for conversion dated December 2005
- Site interviews with the Bellsouth representatives
- Site interviews with Comcast representatives

- Census data from the Town records
- Additional detail of plant quantities from FPL
- Current PSC regulations
- FPL tariffs for underground conversion

General Assumptions

Due to the high-level nature of this assessment, a number of important assumptions are required. These assumptions are noted below.

- Overhead to underground conversion costs are limited to the primary providers of electric power and telecommunications services (e.g. FPL, BellSouth and Comcast). Wireless service providers, such as cellular telephony, are not included.
- While the system characteristics of future networks might be significantly different from the status quo, cost estimates strictly focus on replacing existing networks with their identical underground counterparts. Any incremental costs related to improvements in system characteristics (e.g. replacing overhead copper wire with underground fiber optic cable) would be the responsibility of that utility.
- This report is founded on high level cost analyses and is not intended to be used for budgetary purposes.
- This report does not include any in-depth system design considerations.
- The information contained in this report is based on two brief field inspections of the Town of Palm Beach, Florida, conversations with staff at FPL, Comcast and BellSouth and R. W. Beck's prior experience in related matters.
- Facilities would be installed inside the existing Right-of-Way to prevent private easements. Where this concept is not possible, private easement must be obtained; cost for easement acquisition is not included. This would require the Town to agree to "keep FPL whole" for future road work.
- Cost estimates are prepared based on typical industry standard practices and costs. Individual company overhead allocation will vary greatly and could significantly impact the cost. Cost savings may exist if the Town installs all equipment and donates installed facilities to FPL.
- Service entrances for a majority of the homes are already underground due to the existing town ordinance; therefore, no cost has been included for these private facility modifications. Cost has been included for the replacement of the underground FPL conductors to reflect the new location of the electric facilities.
- Electronic or node equipment for telephone and cable facilities are usually located at grade level in pad mounted cabinets, therefore the telephone and cable conversion cost assumes these will be re-used.

- Underground electric equipment type and installation practices were based on FPL standard design practices. Once design begins, other practices should be considered to increase reliability and storm responses. Items to consider would be subsurface style switchgear, concrete encased duct bank, and vacuum or SF_6 insulated switchgear. These items would impact overall cost and may improve reliability to the Town.
- The basic methodology of installation was assumed to be utilizing open trenching methods. Directional boring could be utilized to minimize the disturbances to the public. The cost impact would be negligible if a reduction in the number of spares was implemented. The Utilities have expressed a desire to utilize directional boring where practical.

Section 1

EXISTING PLANT SUMMARY

Section 1
EXISTING PLANT SUMMARY

1.1 Customer Base for Utility Services

One attribute that directly impacts the cost of underground services is Palm Beach's total customer base for utility services and the segment which is currently served by overhead systems. The overhead systems located in the Town of Palm Beach are primarily owned by FPL, Comcast and BellSouth. Adelphia previously owned some local assets, but these were acquired by Comcast during 2006. Wireless telephony facilities, such as cellular towers, are also expected to be located within Palm Beach, but are assumed to be outside of the scope of this analysis due to their limited visual impacts. The Palm Beach market is summarized in the following table.

Table 1-1
Customer Base

Market Segment	Number of Units
Single Family Housing	2,455
Condominium Buildings	116
Apartment Buildings	66
Business/Commercial	214
Total	2,851

1.2 Existing Overhead Plant - Comcast

Comcast's overhead plant in the Town is comprised of backbone fiber optic and coaxial lines (hard line plant) and service drops which connect the backbone system to customers (soft line plant). In addition, Comcast owns considerable head-end facilities, but these are not located in the Town. Verbal information provided by Comcast indicates that there is 37.21 miles of overhead hard line.

In contrast, Comcast does not have an estimate for the length of its soft line plant, but did indicate that individual service drops typically range from 100 to 150 feet (125 feet is average). This figure can easily be translated into an estimate for total soft line plant, if the number of Comcast customers were known. Unfortunately, Comcast was not able to provide any customer data; however, Comcast did provide some verbal estimates for its percentage of overhead customers by class, as shown in the following table. In the absence of actual customer counts, R. W. Beck applied its experience in such matters and finds that typical penetration rates for household cable television in Palm Beach could be 85%. Similarly, penetration rates for businesses range between

10% and 35%. Collectively, these data lay the foundation for estimating overhead customers, which are summarized below.

Table 1-2
Comcast's Customer Base

Market	Total Number	Overhead Customers	Penetration Rate (Average)	Overhead Customers
Residential	2,455	95%	85%	1,749
Apartments	66	10%	85%	5
Condominiums	116	10%	85%	9
Businesses	214	90%	22.5%	43
Total	**2,851**			**1,806**

Differences between the forecasted and actual number of overhead customers will directly affect the estimated number of required overhead conversions and resultant costs.

1.3 Existing Overhead Plant - BellSouth

Verbal communications with BellSouth indicated that it did not readily know its number of customers or length of its overhead networks. Consequently, this report includes several high-level assumptions in estimating the cost of system conversions.

The total number of accounts appears to be greatly different from the statistics provided by the Town. This has been attributed to the number of apartment and condo units per parcel and the number of individual accounts located on a single residential parcel.

Table 1-3
BellSouth's Customer Base

Market	Total Number	Overhead Customers	Penetration Rate (Average)	Overhead Customers
Residential	2,455	95%	100%	2,332
Apartments	66	10%	100%	7
Condominiums	116	10%	100%	12
Businesses	214	90%	100%	193
Total	**2,851**			**2,544**

1.4 Existing Overhead Plant - FPL

The existing electrical plant consists of mainly overhead 13kV construction. The Town is served by 12 inter-coastal crossings, which rise to an overhead configuration

at the first available location on the island. The majority of the backbone system is located along the roadside. The exact location in relation to private versus public property is unknown. The majority of the radial primary taps serving the residences in the town are located in a rear lot configuration. The service drops to a majority of the homes are currently underground due to the current Town regulation requiring new services be located underground.

FPL provided a summary of the existing electrical facilities serving the Town. These numbers will be utilized to develop an underground cost as well as an overhead replacement cost. Quantities provided by FPL are as follows:

Table 1-4
FPL Electrical System Characteristics

	Total
Number of existing electric meters	**9,400** *(Residential – 8,000)* *(Non-Residential – 1,400)*
Number of Poles	**1,970**
Number of miles of OVH backbone lines	**26**
Number of miles of OVH tap lines	**13**
Number of miles of UG backbone lines	**9**
Number of miles of UG tap lines	**24**
Number of overhead transformers	**800**
Number of underground transformers	**220**

Section 2

COST DRIVERS AND ASSUMPTIONS

Section 2
COST DRIVERS AND ASSUMPTIONS

2.1 Introduction

There are a number of drivers that could have a significant impact on forecasting the cost of converting overhead utility systems to underground. Unfortunately, some of these drivers are relatively uncertain and cannot be fully explored until the design or detailed cost estimating process begins. In light of such issues, this section addresses the drivers that could significantly affect the high-level underground conversion costs that are presented here.

2.2 Project Management

An undertaking of this magnitude will require a substantial project management effort. A Project Manager would represent the Town, serve as a single point of contact between property owners and the construction effort, and requires a background in electric power and telecommunications systems. The Project Manager would be responsible for ensuring that the Town's concerns are met (e.g. minimize impacts to constituents, permitting and construction regulations). Additional responsibilities would include:

- Coordinating schedules between utilities (especially required for joint trenching) to avoid redundant street digs
- Coordinating effected roads to minimize road closures, delays and impacts to local constituents
- Reviewing and reporting on forecasted and actual budgets
- Conducting construction monitoring
- Coordinating the Town's internal permitting and construction staff

Costs related to project management have been estimated at 8% and are included in this analysis.

2.3 Legal

Construction may result in unfortunate impacts such as damage to property. It is not known whether such costs would be significant. The potential costs can not be forecasted and have not been included in this analysis.

2.4 Easements

Verbal feedback from the Utilities indicates that they are currently assuming that the Town will perfect all existing easements, as required, and obtain all newly required easements to provide necessary access for the Utilities. Consequently, the cost of obtaining easements has not been included in this estimate.

2.5 Conduit

The Utilities have not currently made a final determination whether its cable plant (e.g. coax, copper and fiber optic) should be directly buried or placed in conduit. Preliminary feedback indicates a preference for conduit and the utilities are assuming that such expense would be borne by the Town. In order to minimize the duration and number of construction activities in an area, the current preferred plan is to have one entity install all conduits for the project. The enclosed cost estimate reflects one party installing all conduits and individual installations.

2.6 Number of Conduits

The Town will need to assess the number of conduits to be placed in the backbone system. One option is to install only the minimum number of conduits that would be required to meet FPL's, BellSouth's and Comcast's immediate needs. However, an alternative approach would be to plan for long range growth and alternative competitive service providers to reduce the need for future street digs. This latter approach would likely install additional conduit at a higher cost. The estimate includes a prudent number of spares since the location and number of spares is impossible to forecast and would significantly impact the cost of the project.

2.7 Utilization of City Resources

The project, as currently defined, will require a significant amount of the Town's resources due to the coordination of road crossings, Right-of-Way definition, and underground facility locates.

These efforts would be in addition to the design and project management services defined earlier; therefore the estimate includes a 3% allowance for internal labor expenses.

2.8 Telecommunications Electronics

Since BellSouth and Comcast have not yet performed a detailed design of their underground systems, it is not yet feasible to identify or estimate the cost of required electronic equipment. It is assumed the existing equipment could be re-implemented since a majority of the equipment is already pad mounted at strategic locations

2.9 Cable (Coax, Copper and Fiber Optic)

There have been many significant technological advances in the field of telecommunications since the original Palm Beach networks were installed. One industry-wide change has been the replacement of traditional copper wire with fiber optic cable. Fiber optic cables are capable of carrying a great deal more traffic than their copper based counterparts.

Today, it appears that much of BellSouth's overhead and underground networks are comprised of copper circuits. If ordered to convert its overhead plant, BellSouth might wish to replace copper circuits with fiber optic cables.

Therefore a new underground cable plant is expected to be comprised of coax and fiber optics. Historically, voice based systems have extensively used copper wire for such projects. However, BellSouth has verbally indicated that it may replace much of its existing copper plant with fiber optics. This approach is commonly referred to as fiber to the curb (FTTC). FTTC has the capability to support significantly more and higher quality services than copper. For example, data or Internet transmission over copper wire is commonly limited to 640 Kbps for digital subscriber lines (DSL) and 1.544 Mbps for T1 lines. In contrast, FTTC is potentially suitable to support bandwidths that are 100 times greater. The basic impact is a potential increased level of service to the general population.

Even though this upgrade would provide an upgraded service to the City's population, the cost for the incremental capacity or capability of the new facilities should be the responsibility of the Utility and be deemed a betterment. See discussions below regarding betterment allowances.

2.10 No Betterment

The assessment conducted in this report assumes that the utilities would be permitted to only replace existing overhead assets with like underground ones. This stipulation is predicated on the concern that the Town of Palm Beach should not subsidize system improvements. However, it must be noted that telecommunications technologies and capabilities have improved significantly over time and it is possible that BellSouth and Comcast might wish to install significantly different infrastructure. For example, BellSouth's existing copper backbone lines might be replaced with fiber optic cable. Therefore allowances should be negotiated for perceived betterment.

2.11 Construction Methods

The Utilities face choices between directly burying cable or placing it in conduit, types of conduit, and boring versus trenching. Each choice is accompanied by several advantages and disadvantages. Direct bury is generally less expensive and faster to install while conduit offers more system security at a higher price.

2.12 Phased Implementation

For economic and technical reasons, each utility is likely to build-out its conversion on a different basis. For example, Comcast would be expected to convert its system on a node by node basis while FPL would be expected to do so on a feeder by feeder basis. A coordinated effort will be required to minimize the effects of the Town.

Minimizing construction related impacts and inconveniences to the local community can be accomplished, in part, by carefully coordinating the Utilities needs and scheduling the project in phases.

2.13 Damage to Foliage

The Town's weather encourages the fast, year long growth of numerous different types of foliage. Consequently, the roots of existing plants could become damaged during construction, thereby creating an unforeseen financial liability.

2.14 Joint Trenching

By using a common trench, the total cost of the proposed underground conversion could be reduced. However, Comcast and BellSouth have indicated that they may utilize different routes, especially for entrances to premises.

2.15 Construction Period

Ordinarily, utility related construction within Palm Beach is permitted only during part of the year. In order to expedite the project and meet expected schedules, the Utilities would benefit from being able to conduct construction throughout the year. Our understanding is that the Town has agreed to a year long construction schedule for this project.

2.16 Construction Permits

The Utilities may utilize contract and its own crews for this project. Ordinarily, there are limitations on the number of simultaneous vehicles that can work in the Town. Expeditiously completing this project may require a compromise in the number of allowed vehicles.

Section 3

ELECTRIC SYSTEM COST ESTIMATE

Section 3
ELECTRIC SYSTEM COST ESTIMATE

3.1 Electric System Cost Estimate

Current PSC and FPL tariffs (Section 6.3) include a stipulated formula for entities cost responsibilities for conversion of existing overhead electrical facilities to underground facilities. The tariff stipulates the cost of the electrical underground facilities will be based on the actual cost of installation with a 10% allowance for variation.

Current FPL regulations include a formula for an underground replacement project. The current formula is as follows:

$$CAIC = (UG+NBV+R) - (OH+SV)$$

CAIC = Contribution in Aid Of Construction

UG = Estimated cost to install the underground electric distribution facilities

NBV = net book value (book value less accumulated depreciation)

R = Removal cost of the overhead facilities

OH = Estimated cost of a new overhead electrical distribution facility was being installed

SV = Salvage value of the removed facilities

FPL provided a "Non binding" cost for the conversion of $32,000,000. This estimate is the result of the above formula and FPL's estimate of the components above. In order to obtain a detailed design estimate, the Town must pay a fee based on the requested study area. In addition, in order to develop a cost estimate to compare to the FPL estimate, the following assumptions were utilized:

- Main feeder circuits will be designed for 600 Amp Capacity (1000 MCM Aluminum conductor)
- Route will consist of direct embedded duct bank
- Sectionalizing cabinets with junction points will be utilized at tap points
- "PME style" switchgear will be used at potential switching points. Estimated at two switchgear per mile
- Sectionalizing cabinets will be estimated every 500 feet
- Branch circuits will be based on 200 Amp capacity
- Pad-mounted style cabinets will be assumed for switchgear location

- Due to the nature of the island environment, the main feeder may require additional reinforcing to satisfy potential storm surge forces. The final design will need to identify the proper reinforcing.
- All single phase transformers were estimated at 50 KVA
- All three phase transformers were estimated at 150 KVA
- Street lighting will not be included in the estimate. This is a separate project being considered by the Town.
- Optional costs include conduits for telecommunication cables, but do not include relocation labor or other equipment needed to underground the cable and telephone facilities.
- Cost estimates do not include Right-of-Way or construction easement, permitting and/or acquisition costs.
- The location of the switchgear is assumed to be within the Right-of-Way of the road easement. FPL has recently agreed to utilize this space for facilities.
- Minor landscaping will be included for restoration; however disturbance of elaborate landscaping which is located within the Right-of-Way will require special attention.
- The conduit system will be installed by the Town of Palm Beach to facilitate one construction period and efficient use of space.
- Estimate assumes existing electrical services are underground and will not require additional service entrance work (i.e. panel and meter base work).
- Removal cost estimated at 15% of estimated construction cost.
- Overhead replacement costs estimated at $200,000 per mile for three phase backbone system and $100,000 for overhead three phase tap lines, and $75,000 for overhead single phase lines.
- Estimates based on standard construction pricing.
- The breakdown provided by FPL did not differentiate between three phase and single phase tap lines. A 50/50 spilt was assumed.
- Salvage value was assumed to be equal to 50% of the replacement cost of the existing overhead transformers.

The derivation of the overhead replacement is outlined in Table 3-1:

Table 3-1
Estimated Replacement Cost of Overhead Electric Facilities

Unit	Quantity	Unit Cost	Extended Cost
Three Phase backbone	26	$200,000	$ 5,200,000
Three Phase Tap	6.5	$100,000	$650,000
Single phase Tap	6.5	$75,000	$487,500
Transformers	800	$ 2,000	$1,600,000
Services	1700	$1,000	$1,700,000
Total			**$ 9,637,500**

These assumptions along with information provided by FPL and current industry pricing components will allow the derivation of each of the elements in the CIAC formula. The estimated components are as follows:

Table 3-2
Estimated Component

CIAC	With Joint Trenching	Without Joint Trenching
UG	$52,470,134	$53,928,311
NBV	$6,400,000	$6,400,000
R	$1,445,625	$1,445,625
OH	$9,637,500	$9,637,500
SV	$800,000	$800,000
Total	**$49,878,259**	**$51,336,436**

3.2 Storm-Hardened Overhead Construction Cost

The CIAC formula includes an overhead replacement cost factor (OH) that could be affected by a joint proposal filed on behalf of the Florida IOUs and currently under consideration by the Florida PSC. The purpose of this proposal is to mitigate the effects of severe storms on utility infrastructure and includes a provision to "storm-harden" overhead distribution facilities over and above those construction standards currently prescribed by National Electrical Safety Code (NESC). If the proposed construction guidelines are adopted, new distribution facilities would be designed to withstand extreme wind loading conditions up to 150 mph along some Florida coastal regions. The added costs associated with "storm-hardened" construction standards will be manifested primarily in the installation of higher ANSI-class poles. Typically, main feeders will require a heavy class concrete pole while overhead laterals will include wood poles with a much greater loading (moment) capacity than those installed under current standards.

To estimate the impact of the proposed "storm-hardening" standards on future distribution construction costs, an NESC extreme-wind weather case of 56.7 psf (150 mph) was applied to a typical main feeder structure meeting NESC Light Loading District Grade C construction standards. The analysis used a typical wind span of 175 feet, .556kcmil ACSR conductor, #4/0 AWG ACSR neutral, and two communications cables on a 45 foot Class 2 wood pole. Under the extreme wind conditions specified, a Class H3 wood-equivalent concrete pole was required to meet proposed "storm-hardened" design standards. Similar analysis was applied to typical three-phase and single-phase overhead laterals.

To arrive at an estimate for the added cost impact of "storm-hardened" construction standards, material and labor cost differentials for the heavier class poles were used, in addition to an allowance for the utilization of higher capacity guying and higher strength insulators on main feeders. As a result, the total estimated impact of these proposed construction standards on the CIAC overhead replacement cost component is an increase of 10-15 percent.

Section 4

BELLSOUTH COST ESTIMATE

Section 4
BELLSOUTH COST ESTIMATE

4.1 Introduction

Estimating the cost of converting BellSouth's overhead telecommunications systems to underground has been pursued by verbally interviewing selected staff at BellSouth and utilizing R. W. Beck's existing data in similar matters. BellSouth's overhead system in the Town of Palm Beach is primarily comprised of main lines, laterals and service drops. At this point in time, BellSouth has not estimated the cost of converting its overhead facilities. The costs associated with converting each component are examined below.

The current Bellsouth Service tariff dated August 1 2006, addresses the requirements for requesting and executing a formal conversion study by Bellsouth.

It must noted that these costs are planning level estimates only and require further refinement before using for budgetary purposes.

4.2 BellSouth Cost Estimate – Main Lines

BellSouth verbally reported that its typical cost for converting overhead primary lines to underground is between $121.21 per foot and $132.66 per foot. It is R. W. Beck's opinion that while these unit costs appear to be high, they are suitable for the purposes of this study.

BellSouth does not currently have an estimate of the length of its total main line plant. However, an estimate can be derived by taking the total length of Ocean County or Lake Roads, since BellSouth's backbone system generally follows these roads. The length of these roads was measured from scaled maps that were provided by the Town of Palm Beach.

Based on these assumptions, the cost of converting BellSouth's main lines would be approximately $2,395,000.

4.3 BellSouth Cost Estimate – Laterals

BellSouth verbally reported that its typical cost for converting overhead laterals to underground is between $19.53 per foot and $26.04 per foot (average cost is $22.79 per foot). It is R. W. Beck's opinion that these costs are probably conservatively high, especially when accounting for the economies of scale that are available in converting a significant amount of the system at one time, but serve the objectives of this report.

Once again, BellSouth does not currently have an estimate of its total lateral overhead plant. Consequently, an estimate was derived by assessing the total length of all streets within Palm Beach that are served by overhead telephone systems. Based on these data, the total cost of laterals would be $2,217,000.

4.4 BellSouth Cost Estimate – Service Drops

BellSouth verbally reported that its typical cost for converting overhead service drops to underground varies by type of customer. Reported cost estimates were $250 for each residence and $1,000 for each business, condominium and apartment building.

While BellSouth does not have an estimate of its total service drop plant or number of customers by class, an estimate was derived from the Town of Palm Beach's data bases. This source of information resulted in the following customer estimated class allocations:

- Residences: 2,455 (95% overhead)
- Apartment Buildings: 66 (10% overhead)
- Condominium Buildings: 116 (10% overhead)
- Businesses: 214 (90% overhead)

Based on the above assumed data and the previously derived underground service quantities, the total cost to convert all overhead service drops to underground would be roughly $794,000.

4.5 BellSouth Cost Estimate – Summary

The above cost estimates assume that BellSouth would be pursing its underground conversion alone, without any coordination with other utilities. However, earlier in this report it was pointed out that significant cost savings could be captured by joint trenching. The following table summarizes BellSouth's conversion costs with and without joint trenching.

Table 4-1
BellSouth Conversion Cost Estimate Summary

	Conversion Cost	
	Without Joint Trenching	**With Joint Trenching**
Main Line Plant	$2,395,000	$2,395,000
Credit Joint Trenching	$0	$(540,635)
Lateral Plant	$2,217,000	$2,217,000
Service Drops	$794,000	$794,000
Palm Beach Expenses	$162,000	$146,000
Palm Beach PM	$433,000	$389,000
Subtotal	**$6,001,000**	**$5,400,000**

Section 5

COMCAST COST ESTIMATE

Section 5
COMCAST COST ESTIMATE

5.1 Introduction

Estimating the cost of converting Comcast's overhead cable television (CATV) networks to underground has been pursued by verbally interviewing selected staff at Comcast and utilizing R. W. Beck's existing data in similar matters. Comcast's overhead system in the Town of Palm Beach is primarily comprised of hard and soft line plant. The costs associated with converting each component are examined below.

The Hard line plant for a cable system is analogous to a backbone or main line system. The Soft Line plant for a cable system is analogous to the service laterals for an electric system

It must noted that these costs are planning level estimates only and require further refinement before using for budgetary purposes.

5.2 Comcast Cost Estimate – Hard Line Plant

Verbal information provided by Comcast indicates that there is 37.21 miles of overhead hard line plant that costs roughly $80,000 per mile ($15.15 per foot) to convert to underground. These data assume that some boring would be required. This would result in a total hard line plant cost of $2,976,800.

5.3 Comcast Cost Estimate – Joint Trenching Credits to Hard Line Plant

The above figure assumes that Comcast would not jointly trench its hard line plant with any other utility. However, if joint trenching were utilized, then conversations with Comcast indicate that a credit of roughly $2.00 per foot could be realized. However, differences between system routes and requirements for each utility preclude the feasibility to assume that all of Comcast's hard line plant could be jointly trenched. For the purposes of this high-level analysis, it was assumed that 90% of Comcast's hard line plant, or 33.49 miles, could be jointly trenched.

Based on these assumptions, the potential joint trenching credit to the cost of Comcast's hard line plant is roughly $354,000, causing the total hard line cost to be roughly $2,623,000.

5.4 Comcast Cost Estimate – Soft Line Plant

The next step is to estimate the cost of converting Comcast's soft line plant by using its customer data noted in the preceding section and R. W. Beck's experience in related matters. Comcast indicated that the cost of converting a single residence, apartment building, condominium building or businesses would be roughly $100 each. In addition, boring costs would be required to gain access beneath driveways and roads at a cost of $7.00 per foot. Based on these assumptions, the cost of soft line plant conversion is summarized in the following table.

Table 5-1
Conversion Costs for Comcast's Soft Line Plant

Market	Number	Total Cost
Residential	2,455	$456,000
Apartments	66	$24,000
Condominiums	116	$42,000
Businesses	214	$79,000
Total	2,851	$601,000

The above table indicates that the cost of converting Comcast's overhead soft line plant to underground would be roughly $601,000. This figure assumes that there no credits available from joint trenching since each utility might enter the customer's premise from the either the front or back lot line.

5.5 Comcast Cost Estimate – Summary

In summary, the cost to convert Comcast's existing overhead system to underground would be roughly $3.9 million without joint trenching and $3.5 million with a credit for joint trenching, as shown in the following table.

Table 5-2
Comcast's Conversion Cost Estimate Summary

	Conversion Cost	
	Without Joint Trenching	**With Joint Trenching**
Hard Line Plant	$2,976,800	$2,976,800
Soft Line Plant	$601,000	$601,000
Joint Trench Credit	N/A	$ (354,000)
Subtotal	$3,577,800	$3,223,800
Palm Beach Expenses	$107,000	$96,700
Project Management	$286,000	$257,900
Total	**$3,970,800**	**$3,578,400**

Appendix A

ELECTRIC COST ESTIMATE

Palm Beach

With Joint Trenching

ASSUMPTIONS FOR UNDERGROUND CONSTRUCTION:

171600	3 PHASE - FEEDER LENGTH	1. Cable is in non concrete encased conduit
34320	1 PHASE - FEEDER LENGTH	2. Restoration Costs are part of trenching or boring unit.
	SECONDARY CABLE	3. No Cost has beed included for ROW clearing (This should be minimal).
	TRANSFORMERS	

BID UNIT DESCRIPTION	# OF UNITS	UNIT	LABOR	MAT'L	UNIT PRICE	EXT. PRICE	COST PER FT
MAIN FEEDER - 3 PHASE PRIMARY							
3 PH RISER ASSEMBLY		EA	$ 2,500.00	$ 4,000.00	$ 6,500.00	$ -	
CABLE, 1-1000 AL , Al, CXN	137280	FEET	$ 10.00	$ 35.00	$ 45.00	$ 6,177,600.00	
DIRECTIONAL BORING (POWER) 10% Avg.		FEET			$ 49.50	$ -	
DUCTBANK- 16-4" Concrete Encased		FEET	$ 45.00	$ 75.00	$ 120.00	$ -	
DUCTBANK- 12-4" Concrete Encased		FEET	$ 40.00	$ 65.00	$ 105.00	$ -	
DUCTBANK- 4-6" +2-2" Non Concrete Encased	137280	FEET	$ 35.00	$ 45.00	$ 80.00	$ 10,982,400.00	
TRENCHING (Includes Backfill, & Restoration)	137280	FEET	$ 15.00	$ 15.00	$ 30.00	$ 4,118,400.00	
PILINGS(One per 100 feet)	0	FEET	$ 500.00	$ 500.00	$ 1,000.00	$ -	
SPLICES							
MISCELLANEOUS (Traffic, Vault Racks, Splices)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
TOTAL PRIMARY COST (Three Phase):						$ 21,278,400.00	
PRIMARY - THREE PHASE 200 Amp							
CABLE, 4/0, AL URD, EPR or XLP	34320	FEET	$ 3.00	$ 10.00	$ 13.00	$ 446,160.00	
DIRECTIONAL BORING (POWER)	0	FEET			$ -	$ -	
DUCTBANK- 2-4" + 2-2" concrete Encased	34320	FEET	$ 25.00	$ 30.00	$ 55.00	$ 1,887,600.00	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 15.00	$ 15.00	$ 30.00	$ -	
MISCELLANEOUS (Traffic, Elbows, Vault Racks, Splices)	0	FEET	$ 2.50	$ 2.50	$ 5.00	$ -	
TOTAL PRIMARY COST (Single Phase):						$ 2,333,760.00	
PRIMARY - SINGLE PHASE-200 Amp-							
CABLE, 1/0, AL URD, EPR or XLP	34320	FEET	$ 3.00	$ 3.00	$ 6.00	$ 205,920.00	
DIRECTIONAL BORING (POWER)	0	FEET			$ -	$ -	
DUCTBANK- 2-4" + 2-2" concrete Encased	34320	FEET	$ 25.00	$ 30.00	$ 55.00	$ 1,887,600.00	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
MISCELLANEOUS (Traffic, Elbows, Vault Racks, Splices)	0	FEET	$ 2.50	$ 2.50	$ 5.00	$ -	
TOTAL PRIMARY COST (Single Phase):						$ 2,093,520.00	
SECONDARY							
600V SECONDARY CABLE (4/0 AL)		FEET	$ 4.00	$ 2.00	$ 6.00	$ -	
DIRECTIONAL BORING (POWER)	0	FEET			$ -	$ -	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
TOTAL SECONDARY COST:						$ -	
TRANSFORMERS							
150 KVA, 3 PH, LF, 120/208	100	EA	$ 500.00	$ 4,850.00	$ 5,350.00	$ 535,000.00	
300 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 8,400.00	$ 8,900.00	$ -	
500 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 14,000.00	$ 14,500.00	$ -	
750 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 21,000.00	$ 21,500.00	$ -	
1000 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 23,000.00	$ 23,500.00	$ -	
50 KVA, 1 PH, LF, 120/240	500	EA	$ 500.00	$ 1,500.00	$ 2,000.00	$ 1,000,000.00	
100 KVA, 1 PH, LF, 120/240		EA	$ 500.00	$ 2,200.00	$ 2,700.00	$ -	
CONCRETE PAD, 3PH TRANSFORMER	600	EA	$ 500.00	$ 500.00	$ 1,000.00	$ 600,000.00	
CABLE WELL UNDER PADS		EA	$ 500.00	$ 1,000.00	$ 1,500.00	$ -	
GROUNDING, RODS & CABLE, 3 PH	600	EA	$ 85.00	$ 30.00	$ 115.00	$ 69,000.00	
LOAD BREAK 200A ELBOWS	1600	EA	$ 100.00	$ 50.00	$ 150.00	$ 240,000.00	
TOTAL TRANSFORMER COST:						$ 1,909,000.00	
JUNCTIONS & SWITCHES							
SECTIONALIZING JUNCTION (Three phase 600 A)	274.56	EA	$ 1,500.00	$ 3,000.00	$ 4,500.00	$ 1,235,520.00	
SECTIONALIZING JUNCTION (three phase 200A)	68.64	EA	$ 500.00	$ 2,000.00	$ 2,500.00	$ 171,600.00	
PME-6 with SMU 20 style fuses		EA	$ 2,000.00	$ 14,000.00	$ 16,000.00	$ -	
PME-9 with SMU 20 style fuses	52	EA	$ 2,000.00	$ 16,000.00	$ 18,000.00	$ 936,000.00	
PME-11 with SMU 20 style fuses		EA	$ 2,000.00	$ 18,000.00	$ 20,000.00	$ -	
PADS FOR ABOVE EQUIPMENT		EA	$ 500.00	$ 500.00	$ 1,000.00	$ -	
Large MANHOLES (Includes Excav., Backfill)	275	EA	$ 3,000.00	$ 3,000.00	$ 6,000.00	$ 1,650,000.00	
Small MANHOLES (Includes Excav., Backfill)	69	EA	$ 2,000.00	$ 2,000.00	$ 4,000.00	$ 274,560.00	
DEAD FRONT 200A ELBOWS	1233	EA	$ 100.00	$ 50.00	$ 150.00	$ 184,950.00	
DEAD FRONT 600A ELBOWS	2943	EA	$ 150.00	$ 200.00	$ 350.00	$ 1,030,050.00	
Splices 600 Amp		EA	$ 235.00	$ 160.00	$ 395.00	$ -	
	0	EA	$ 235.00	$ 160.00	$ 395.00	$ -	
TOTAL JUNCTION & SWITCH COST:						$ 5,482,680.00	
				SUBTOTAL: EQUIPMENT		$ 33,097,360.00	
MISC COST							
Telecomm comunication Boxes		EA	$ 250.00	$ 250.00	$ 500.00	$ -	
	0	FEET				$ -	
						$ -	
Total misc Cost							
SERVICE ENTRANCE COSTS:							
TYPE 1 (Single Phase)	1500	EA	$ 1,000.00	$ 2,500.00	$ 3,500.00	$ 5,250,000.00	
TYPE 2 (Three Phase)	200	EA	$ 1,000.00	$ 4,000.00	$ 5,000.00	$ 1,000,000.00	
TOTAL SERVICE ENTRANCE COSTS						$ 6,250,000.00	
					SUBTOTAL:	**$ 39,347,360.00**	
CONTRACTOR MOBILIZATION					1%	$ 393,473.60	
SUBTOTAL						$ 39,740,833.60	
CONTINGENCY					15%	$ 5,961,125.04	
SUBTOTAL						$ 45,701,958.64	
ENGINEERING & DESIGN					7%	$ 3,199,137.10	
PROJECT MANAGEMENT					8%	$ 3,656,156.69	
OWNER'S OVERHEAD EXPENSE					3%	$ 1,371,058.76	
SUBTOTAL						$ 53,928,311.20	
							$ 266.33
ENVIRONMENTAL					0%	$ -	
SUBTOTAL						$ 53,928,311.20	
TOTAL FOR UNDERGROUND				171600	Footage	**$ 53,928,311.20**	
TOTAL / FT							$ 314.27

Palm Beach

Without Joint Trenching

ASSUMPTIONS FOR UNDERGROUND CONSTRUCTION:

1. Cable is in non concrete encased conduit
2. Restoration Costs are part of trenching or boring unit.
3. No Cost has beed included for ROW clearing (This should be minimal).

7829	3 PHASE - FEEDER LENGTH
0	1 PHASE - FEEDER LENGTH
	SECONDARY CABLE
	TRANSFORMERS

BID UNIT DESCRIPTION	# OF UNITS	UNIT	LABOR	MAT'L	UNIT PRICE	EXT. PRICE	COST PER FT
MAIN FEEDER - 3 PHASE PRIMARY							
3 PH RISER ASSEMBLY	0	EA	$ 2,500.00	$ 4,000.00	$ 6,500.00	$ -	
CABLE, 1-1000 AL , AI, CXN	137280	FEET	$ 10.00	$ 35.00	$ 45.00	$ 6,177,600.00	
DIRECTIONAL BORING (POWER) 10% Avg.		FEET	$ 100.00	$ 20.00	$ 120.00	$ -	
DUCTBANK- 8-6" Concrete Encased		FEET	$ 45.00	$ 75.00	$ 120.00	$ -	
DUCTBANK- 12-4" Concrete Encased		FEET	$ 40.00	$ 65.00	$ 105.00	$ -	
DUCTBANK- 4-6" Non Concrete Encased	137280	FEET	$ 35.00	$ 40.00	$ 75.00	$ 10,296,000.00	
TRENCHING (Includes Backfill, & Restoration)	137280	FEET	$ 15.00	$ 15.00	$ 30.00	$ 4,118,400.00	
PILINGS(One per 100 feet)	0	FEET	$ 500.00	$ 500.00	$ 1,000.00	$ -	
SPLICES							
MISCELLANEOUS (Traffic, Vault Racks, Splices)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
TOTAL PRIMARY COST (Three Phase):						$ 20,592,000.00	
PRIMARY - THREE PHASE 200 Amp							
CABLE, 4/0, AL URD, EPR or XLP	34320	FEET	$ 3.00	$ 9.00	$ 12.00	$ 411,840.00	
DIRECTIONAL BORING (POWER)	0	FEET	$ 100.00	$ 20.00	$ 120.00	$ -	
DUCTBANK- 2-4" concrete Encased	34320	FEET	$ 25.00	$ 25.00	$ 50.00	$ 1,716,000.00	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 15.00	$ 15.00	$ 30.00	$ -	
MISCELLANEOUS (Traffic, Elbows, Vault Racks, Splices)	0	FEET	$ 2.50	$ 2.50	$ 5.00	$ -	
TOTAL PRIMARY COST (Single Phase):						$ 2,127,840.00	
PRIMARY - SINGLE PHASE-200 Amp-							
CABLE, 1/0, AL URD, EPR or XLP	34320	FEET	$ 3.00	$ 3.00	$ 6.00	$ 205,920.00	
DIRECTIONAL BORING (POWER)	0	FEET	$ 100.00	$ 20.00	$ 120.00	$ -	
DUCTBANK- 2-4" concrete Encased	34320	FEET	$ 25.00	$ 25.00	$ 50.00	$ 1,716,000.00	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
MISCELLANEOUS (Traffic, Elbows, Vault Racks, Splices)	0	FEET	$ 2.50	$ 2.50	$ 5.00	$ -	
TOTAL PRIMARY COST (Single Phase):						$ 1,921,920.00	
SECONDARY							
600V SECONDARY CABLE (4/0 AL)		FEET	$ 4.00	$ 2.00	$ 6.00	$ -	
DIRECTIONAL BORING (POWER)	0	FEET			$ -	$ -	
TRENCHING (Includes Conduits and Restoration)	0	FEET	$ 5.00	$ 5.00	$ 10.00	$ -	
TOTAL SECONDARY COST:						$ -	
TRANSFORMERS							
150 KVA, 3 PH, LF, 120/208	100	EA	$ 500.00	$ 4,850.00	$ 5,350.00	$ 535,000.00	
300 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 8,400.00	$ 8,900.00	$ -	
500 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 14,000.00	$ 14,500.00	$ -	
750 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 21,000.00	$ 21,500.00	$ -	
1000 KVA, 3 PH, LF, 120/208		EA	$ 500.00	$ 23,000.00	$ 23,500.00	$ -	
50 KVA, 1 PH, LF, 120/240	500	EA	$ 500.00	$ 1,500.00	$ 2,000.00	$ 1,000,000.00	
100 KVA, 1 PH, LF, 120/240		EA	$ 500.00	$ 2,200.00	$ 2,700.00	$ -	
CONCRETE PAD, 3PH TRANSFORMER	600	EA	$ 500.00	$ 500.00	$ 1,000.00	$ 600,000.00	
CABLE WELL UNDER PADS		EA	$ 500.00	$ 1,000.00	$ 1,500.00	$ -	
GROUNDING, RODS & CABLE, 3 PH	600	EA	$ 85.00	$ 30.00	$ 115.00	$ 69,000.00	
LOAD BREAK 200A ELBOWS	1600	EA	$ 100.00	$ 50.00	$ 150.00	$ 240,000.00	
TOTAL TRANSFORMER COST:						$ 1,909,000.00	
JUNCTIONS & SWITCHES							
SECTIONALIZING JUNCTION (Three phase 600 A)	274.56	EA	$ 1,500.00	$ 3,000.00	$ 4,500.00	$ 1,235,520.00	
SECTIONALIZING JUNCTION (three phase 200A)	68.64	EA	$ 500.00	$ 2,000.00	$ 2,500.00	$ 171,600.00	
PME-6 with SMU 20 style fuses		EA	$ 2,000.00	$ 14,000.00	$ 16,000.00	$ -	
PME-9 with SMU 20 style fuses	52	EA	$ 2,000.00	$ 16,000.00	$ 18,000.00	$ 936,000.00	
PME-11 with SMU 20 style fuses		EA	$ 2,000.00	$ 18,000.00	$ 20,000.00	$ -	
PADS FOR ABOVE EQUIPMENT		EA	$ 500.00	$ 500.00	$ 1,000.00	$ -	
Large MANHOLES (Includes Excav., Backfill)	275	EA	$ 3,000.00	$ 3,000.00	$ 6,000.00	$ 1,650,000.00	
Small MANHOLES (Includes Excav., Backfill)	69	EA	$ 2,000.00	$ 2,000.00	$ 4,000.00	$ 274,560.00	
DEAD FRONT 200A ELBOWS	1233	EA	$ 100.00	$ 50.00	$ 150.00	$ 184,950.00	
DEAD FRONT 600A ELBOWS	2943	EA	$ 150.00	$ 200.00	$ 350.00	$ 1,030,050.00	
Splices 600 Amp		EA	$ 235.00	$ 160.00	$ 395.00	$ -	
	0	EA	$ 235.00	$ 160.00	$ 395.00	$ -	
TOTAL JUNCTION & SWITCH COST:						$ 5,482,680.00	
				SUBTOTAL: EQUIPMENT		$ 32,033,440.00	
MISC COST							
Telecomm comunication Boxes		EA	$ 250.00	$ 250.00	$ 500.00	$ -	
	0	FEET			$ -	$ -	
		EA			$ -	$ -	
Total misc Cost							
SERVICE ENTRANCE COSTS:							
TYPE 1 (Single Phase)	1500	EA	$ 1,000.00	$ 2,500.00	$ 3,500.00	$ 5,250,000.00	
TYPE 2 (Three Phase)	200	EA	$ 1,000.00	$ 4,000.00	$ 5,000.00	$ 1,000,000.00	
TOTAL SERVICE ENTRANCE COSTS						$ 6,250,000.00	
					SUBTOTAL:	**$ 38,283,440.00**	
CONTRACTOR MOBILIZATION					1%	$ 382,834.40	
SUBTOTAL						$ 38,666,274.40	
CONTINGENCY					15%	$ 5,799,941.16	
SUBTOTAL						$ 44,466,215.56	
ENGINEERING & DESIGN					7%	$ 3,112,635.09	
PROJECT MANAGEMENT					8%	$ 3,557,297.24	
OWNER'S OVERHEAD EXPENSE					3%	$ 1,333,986.47	
SUBTOTAL						$ 52,470,134.36	
							$ 5,679.68
ENVIRONMENTAL					0%	$ -	
SUBTOTAL						$ 52,470,134.36	
TOTAL FOR UNDERGROUND				7829	Footage	**$ 52,470,134.36**	
TOTAL / FT							$6,702.02

Appendix B

COMCAST COST ESTIMATE

Underground Conversion Cost Estimate: Comcast

Hard Line Plant: Comcast Sole Trench

Length		37.21	Miles
Cost per Foot	$	15.15	Per Foot
Cost per Mile	$	80,000	Per Mile
Subtotal Cost (Includes Boring and Conduit)	$	2,976,800	

Hard Line Plant: Comcast and FPL Joint Trench

Length		37.21	Miles
Percent Feasible for Joint Trenching		90%	
Trenching Cost	$	2.00	Per Foot
Trenching Cost per Mile	$	10,560	Per Mile
Trenching Cost	$	353,644	
Cost without Joint Trenching	$	2,976,800	
Joint Trenching Credit	$	(353,644)	
Total Hard Line Plant Cost	$	2,623,156	

Soft Line Plant: Households

Total Households		2,455	Units
Overhead Service		95%	
CATV Penetration Rate		85%	Low Estimate
CATV Penetration Rate		85%	High Estimate
Cost per Household	$	100.00	Each
Subtotal Cost - Low	$	198,241	
Subtotal Cost - High	$	198,241	
Subtotal Cost - Average	$	198,241	
Total Households		2,455	Units
Boring Cost	$	7.00	Per Foot
Household Boring Length (Average Driveway)		30.00	Feet
Households Requiring Boring (Front Access)		50%	
Boring Cost for Households	$	257,775	
Household Cost - Low	$	456,016	
Household Cost - High	$	456,016	
Household Cost - Average	$	456,016	

Soft Line Plant: Apartment Buildings

Total Apartment Buildings		66	Buildings
Overhead Service		10%	
CATV Penetration Rate		85%	Low Estimate
CATV Penetration Rate		85%	High Estimate
Cost per Appartment	$	100.00	Each
Subtotal Cost - Low	$	561	
Subtotal Cost - High	$	561	
Subtotal Cost - Average	$	561	
Total Apartment Buildings		66	Units
Boring Cost	$	7.00	Per Foot
Apartment Boring Length (Average Driveway)		50.00	Feet
Apartments Requiring Boring (Front Access)		100%	
Boring Cost for Apartments	$	23,100	
Apartment Cost - Low	$	23,661	
Apartment Cost - High	$	23,661	
Apartment Cost - Average	$	23,661	

Underground Conversion Cost Estimate: Comcast

Soft Line Plant: Condominiums

Total Condominium Buildings		116	Buildings
Overhead Service		10%	
CATV Penetration Rate		85%	Low Estimate
CATV Penetration Rate		85%	High Estimate
Cost per Appartment	$	100.00	Each
Subtotal Cost - Low	$	986	
Subtotal Cost - High	$	986	
Subtotal Cost - Average	$	986	
Total Condominium Buildings		116	Units
Boring Cost	$	7.00	Per Foot
Condominium Boring Length (Average Driveway)		50.00	Feet
Condominiums Requiring Boring (Front Access)		100%	
Boring Cost for Condominiums	$	40,600	
Condominium Cost - Low	$	41,586	
Condominium Cost - High	$	41,586	
Condominium Cost - Average	$	41,586	

Soft Line Plant: Businesses

Total Businesses		214	Businesses
Overhead Service		90%	
CATV Penetration Rate		10%	Low Estimate
CATV Penetration Rate		35%	High Estimate
Cost per Appartment	$	100.00	Each
Subtotal Cost - Low	$	1,926	
Subtotal Cost - High	$	6,741	
Subtotal Cost - Average	$	4,334	
Total Businesses		214	Units
Boring Cost	$	7.00	Per Foot
Business Boring Length (Average Driveway)		50.00	Feet
Businesses Requiring Boring (Front Access)		100%	
Boring Cost for Businesses	$	74,900	
Business Cost - Low	$	76,826	
Business Cost - High	$	81,641	
Business Cost - Average	$	79,234	

Total Comcast

	Without Joint Trenching	With Joint Trenching
Hard Line Plant	$ 2,976,800	$ 2,976,800
Credit for Joint Trenching	$ -	$ (353,644)
Soft Line Plant (Residences)	$ 456,016	$ 456,016
Soft Line Plant (Apartments)	$ 23,661	$ 23,661
Soft Line Plant (Condominiums)	$ 41,586	$ 41,586
Soft Line Plant (Businesses)	$ 79,234	$ 79,234
Subtotal Comcast Conversion Cost	$ 3,577,297	$ 3,223,653
Town of Palm Beach Labor	107,318.90	96,709.59
Project Management	286,183.74	257,892.23
Total Comcast Conversion Cost	**$ 3,970,799**	**$ 3,578,255**

Appendix C

BELLSOUTH COST ESTIMATE

Underground Conversion Cost Estimate: BellSouth

Sample Conversion Project: Lateral Underground

Lateral Length		220	Feet
Total Lateral Cost	$	5,729.00	
Cost per Foot (Lateral - High)	$	26.04	Per Foot
Potential Savings Due to Scale		25%	
Cost per Foot (Lateral - Low)	$	19.53	Per Foot

Sample Conversion Project: Main Underground

Lateral Length		440	Feet, Each
Number of Laterals		4	
Unit Cost (Low)	$	19.53	
Unit Cost (High)	$	26.04	
Lateral Cost (Low)	$	34,374.00	Total
Lateral Cost (High)	$	45,832.00	Total
Lateral Cost (Average)	$	40,103.00	Total
Total Project Cost	$	167,037.00	
Less Lateral Cost (Low)	$	(34,374.00)	
Cost of Main (High)	$	132,663.00	
Length of Main		1,000.00	Feet
Main Line Unit Cost (High)	$	132.66	Per Foot
Total Project Cost	$	167,037.00	
Less Lateral Cost (High)	$	(45,832.00)	
Cost of Main (Low)	$	121,205.00	
Length of Main		1,000.00	Feet
Main Line Unit Cost (Low)	$	121.21	Per Foot
Cost of Main (Average)	$	126.93	Per Foot

Main Line Analysis

Total Length		94,358.97	Feet
Percent Overhead		20%	
Cost of Main (Average)	$	126.93	Per Foot
Total Main Line Cost	$	2,395,472.21	

Lateral Analysis

Total Length		216,217.95	Feet
Half of Total Length		108,108.98	Feet
Percent Overhead		90%	
Lateral Cost Per Unit (Low)	$	19.53	Per Foot
Total Cost of Laterals (Low)	$	1,900,298	
Total Length		216,217.95	Feet
Half of Total Length		108,108.98	Feet
Percent Overhead		90%	
Lateral Cost Per Unit (High)	$	26.04	Per Foot
Total Cost of Laterals (High)	$	2,533,730	
Total Cost of Laterals (Average)	$	2,217,014	

Service Drops

Number of Residences		2,455	
Residences Receiving Overhead Service		95%	
Cost to Convert Each Residence	$	250.00	Each
Total Cost to Convert Residences	$	583,062.50	
Number of Businesses		214	
Businesses Receiving Overhead Service		90%	
Cost to Convert Each Business	$	1,000.00	Each
Total Cost to Convert Businesses	$	192,600.00	
Number of Condominiums		116	
Condominiums Receiving Overhead Service		10%	
Cost to Convert Each Condominium	$	1,000.00	Each
Total Cost to Convert Condominiums	$	11,600.00	
Number of Apartment Buildings		66	
Apartment Buildings Receiving Overhead Service		10%	
Cost to Convert Each Apartment Building	$	1,000.00	Each
Total Cost to Convert Apartment Building	$	6,600.00	
Total Cost of Service Drops	$	793,862.50	

Total BellSouth

	Without Joint Trenching	With Joint Trenching
Main Lines	$ 2,395,472.21	$ 2,395,472.21
Credit for Joint Trenching	$ -	$ (540,634.88)
Laterals	$ 2,217,014	$ 2,217,014.13
Service Drops	$ 793,863	$ 793,862.50
Subtotal BellSouth Conversion Cost	$ 5,406,348.84	$ 4,865,713.96
Town of Palm Beach Labor	$ 162,190	$ 145,971
Project Management	$ 432,508	$ 389,257
Total BellSouth Conversion Cost	**$ 6,001,047**	**$ 5,400,942**