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DEVELOPMENT OF A UTILITY PRODUCTION RATE SCHEDULING REFERENCE FOR FDOT CONSTRUCTION PROJECTS

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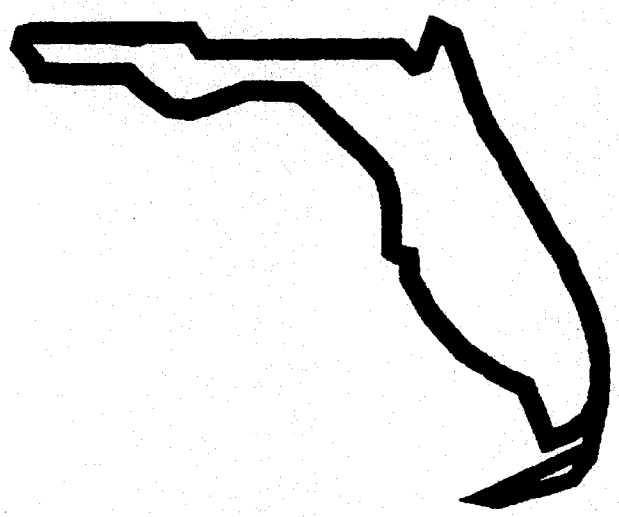
January 2001



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FDOT scheduling engineers need a reliable reference for estimating the duration of different utility relocations encountered on FDOT construction projects. The type of utility work involved on a project may vary considerably. FDOT projects can involve everything from fiber optic systems to conventional storm drainage, often with many different utility systems involved in a single project. Currently the FDOT does not have a comprehensive information base for estimating utility production rates and activity duration.

This report first determines common utility relocation activities from a sampling of FDOT relocation schedules. This list was then verified by FDOT district utility engineers. Next, the research team compared the utility relocation schedule data to data obtained from different utility companies and means manuals. Overall, the relocation schedules are generally an accurate reflection of the time needed to relocate utilities in FDOT construction projects. However, more information and assistance is needed from the different utility industries in order fully verify information acquired from the relocation schedules.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yards	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	ml
gal	gallons	3.785	liters	l
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3

NOTE: Volumes greater than 1000 l shall be shown in m^3.

Symbol	When You Know	Multiply By	To Find	Symbol
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams	Mg
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5(F-32)/9 or (F-32)/1.8	Celcius temperature	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	l
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
psi	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
ml	milliliters	0.034	fluid ounces	fl oz
l	liters	0.264	gallons	gal
m^3	cubic meters	35.71	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3

Symbol	When You Know	Multiply By	To Find	Symbol
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg	megagrams	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact)		
°C	Celcius temperature	1.8C + 32	Fahrenheit temperature	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	psi

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ABSTRACT

FDOT scheduling engineers need a reliable reference for estimating the duration of different utility relocations encountered on FDOT construction projects. The type of utility work involved on a project may vary considerably. FDOT projects can involve everything from fiber optic systems to conventional storm drainage, often with many different utility systems involved in a single project. Currently the FDOT does not have a comprehensive information base for estimating utility production rates and activity duration.

This report first determines common utility relocation activities from a sampling of FDOT relocation schedules. This list was then verified by FDOT district utility engineers. Next, the research team compared the utility relocation schedule data to data obtained from different utility companies and means manuals. Overall, the relocation schedules are generally an accurate reflection of the time needed to relocate utilities in FDOT construction projects. However, more information and assistance is needed from the different utility industries in order to fully verify information acquired from the relocation schedules.

INTRODUCTION

Background

Utility companies often install their lines and facilities on the right-of-way of public roads and streets. This joint use of the right-of-way can be satisfactory when the surface is not disturbed for public use. However, right-of-way sharing often leads to conflicts between State Highway Agencies (SHAs) and the utilities occupying the right-of-way when construction, maintenance, or widening of highways is performed. Whenever delays in construction occur, the conflicts can be costly for the SHA, utility companies, and businesses adjacent to the construction site.

Research on the National Level

Delays from utility relocation have been examined by the General Accounting Office of the Transportation Research Board. The purpose of the GAO's research was to determine the amount of scheduling slippages and increased costs that may be due to delays in utility companies producing, transmitting or disturbing communications, electricity, natural gas, water, and sewage lines. Their research covered the following topics for the fiscal years of 1997-98: the extent to which states are experiencing delays and the causes and impacts of the delays, the number of states compensating construction contractors, the

technologies being used during the design phase to mitigate utility relocation delays, and the mitigation methods being used by the states.

According to this research, states that responded to the survey cited the following reasons for delays: short time frames for planning and designing projects, a lack of resources by utility companies to perform relocation work, and poor timing and coordination. Only ten states reported that these delays had a great or very great impact on the costs and/or construction schedules of highway and bridge projects.

The states may not realize the extent of delays as found by the GAO's study. Contractors indicated that they might not report troubles that may arise from utility relocations since they may work on different segments of the project.

The GAO's study also uncovered these practices:

- Forty-four states compensated contractors for utility relocation delays by extending project completion dates. Thirty states paid contractor's claims for increased costs.
- Some contractors did not seek compensation because they did not desire to prepare the required paperwork, while some assume full financial responsibility for utility relocation delays.

- Computer-aided design and drafting systems are used by forty-three states in the project design phase. This system is also used for designing and mapping projects and locating the utilities.
- Forty-one states used early planning and coordination to help reduce utility relocation delays. Twenty-two states responded that they use special contracting methods. Three states use monetary incentives, seven used monetary penalties, and two used the courts.

Utility Relocation Policies for the Florida Department of Transportation (FDOT)

Section 334.044(1) of the Florida Statutes gives the FDOT the responsibility for coordinating the planning of a safe, viable, and balanced state transportation system serving all regions of the state and the assurance of the compatibility of all components, including multi-modal facilities. The FDOT has published the Utilities Accommodation Manual, which draws upon many resources as guidelines to establish standards for utility work or placement and reimbursement cost within the rights-of-way. This manual sets forth the criteria and procedures of the FDOT for the accommodation of utilities within state transportation facility rights-of-way pursuant to Sections 337.401 through 337.404, Florida Statutes.

The statutes further define the FDOT's responsibilities with regards to the right-of-way policies. The FDOT has the specific authority to prescribe and enforce reasonable rules or regulations governing the placing and maintaining of utilities

along, across, or on any state transportation facility. The FDOT may grant the use of the rights-of-way for a utility in accordance with Department rules or regulations and no utility shall be installed, located, or relocated unless authorized by a written permit issued by the FDOT as provided by Section 337.401(2) of the Florida Statutes. The statutes further maintain that the permit requires the permit holder to be responsible for any damage resulting from the issuance of the permit. In addition, any utility found by the FDOT to be "unreasonably interfering in any way with the convenient, safe, or continuous use, or the maintenance, improvement, extension, or expansion of a state road or publicly owned rail corridor shall, upon proper notice, be removed or relocated by such utility."

The FDOT also recognizes that all utility owners that serve the public have a common obligation to provide their services in a cost effective manner. With these considerations, the FDOT coordinates its advance planning of highway projects with the affected utilities to facilitate the relocation of the utility in order to eliminate costly construction delays. The Utilities Accommodation Manual also states that the FDOT will consider the cost of utility work necessary for the proposed project. Additionally, it states that the FDOT will keep utility agencies informed of future transportation projects. In return, the FDOT requests that the utility agencies advise the FDOT of the location of existing and proposed structures within proposed project corridors.

The FDOT views the utility industry as a statutorily authorized partner in the use of the rights-of-way that the FDOT manages. This results in a shared responsibility with the utility industry to maintain a safe user environment. Either party's actions can negatively or positively effect safety. Each party involved in a utility relocation must begin their evaluations by first establishing the safest course of action and achieving an acceptable balance between benefit and cost.

Research Objective

Relocations and additions to existing utility systems are common on FDOT construction projects. The type of utility work may vary considerably. FDOT projects can involve everything from fiber optic systems to conventional storm drainage. Often many different utility systems are involved on a single project. Typically, the utility work is critical with regard to the overall project schedule. The effectiveness of the overall project schedule is largely dependent on accurately scheduling the project utility activities.

FDOT scheduling engineers need a reliable reference for estimating the duration of the different utility activities encountered on FDOT projects. The time estimates provided by the different utility organizations are often unrealistic and inaccurate. Currently the FDOT does not have a comprehensive information base for estimating utility production rates and activity duration.

Research Approach

The general approach of the research team was to work closely with FDOT and industry professionals who are experienced with utility relocations in the right-of-way area. FDOT utility engineers who actively participate throughout the design, production, and construction phases of a roadway project were also consulted. Additionally, the Florida Utilities Coordinating Committee (F.U.C.C.) was contacted for input. Investigations focused on obtaining a range of times and the influencing factors of the common activities established through research. The research included the following tasks:

Task 1: The research team initially approached the utility industry to establish a list of common utility activities. The research team developed a complete listing of common utility activities encountered on FDOT projects from FDOT utility relocation schedules.

Task 2: The research team met with experienced FDOT utility engineers and refined the complete listing of common utility activities encountered on FDOT projects.

Task 3: The research team met with utility industry personnel to obtain a range of times and influencing factors for the list of common utility

activities. The research team also visited the construction sites of utility relocations to further validate the productivity rates.

Task 4: The research team analyzed the data in the FDOT relocation schedules to see how it matched with the activity durations given by industry representatives.

Task 5: The results of the research are contained in a Final Report. Additionally, a Utility Scheduling Reference Manual will be produced as a stand-alone document to be used by FDOT scheduling engineers as a tool in preparing project schedules. This estimating reference presents production rates for utility work activities within the context of FDOT projects. The range of times and influencing factors for the activities will serve as adjustment factors for the scheduling engineers.

OBTAINING THE DATA

The initial step was to ask local electric, phone, and cable companies for information about their most common relocation activities and the time required for them. These companies were not interested in developing a list of common utility relocations and stated that they would need to know what utility relocation activities we were interested in obtaining times for.

As a result of this initial experience, utility relocation schedules containing a variety of different utility relocations were collected from FDOT district offices. Twelve schedules were obtained from District 2 (Lake City), three schedules were obtained from District 5(Deland), and District 7 (Tampa) sent one schedule. This initial set of projects became the basis of a database that would determine common utility relocations performed in the state. (See Appendix One.)

DEFINING THE PARAMETERS OF THE RESEARCH

A database was created from the collected utility relocation schedules by sorting the utilities by type. After separating the utilities by type (cable, electric, gas, phone, sewer, and water), the data was then sorted by activity. A list of common utility activities was then extracted from all of the data by choosing activities that constituted more than 5% of the data set. Any activities that occurred less than 5% of the time for that utility were not included on the list. The most common pipe size or length of service for that activity was then used to complete the list. (See Appendix Two.) Due to the volume of electric relocations in our utility relocation information, the electric data was separated into underground electric and overhead electric categories.

All of the District Utility Engineers were then asked to verify this list of common activities. They were asked to add or subtract items that they felt would aid a new utility engineer's scheduling experience. Some of the district utility engineers stated that the list did not need any alterations. These were the constructive comments toward the list of common utility activities:

- "I don't feel there is enough depth in the phone section (especially in urban areas). I would like to see a scope for bigger activities. I would like to get the time necessary for splicing a 900 pair phone cable. I would also like to get information on bigger activities so that I can then extrapolate the activities down in size and time."

- "In electric activities there are different types of poles for high and low power transmission and I don't feel that this list reflects that. The most common size of pipe for a water main is 10 – 12". Larger pipes are slower to install at each joint. The right-of-way, materials used, and ground conditions can affect productivity. I suggest a time-in-motion study to properly do this research."
- "The cable section: okay. Gas section: there are a lot of 18 – 20 - 24" high-pressure (990 psi) pipes. Some pipes are encased or lowered after installation. Very frequently, these pipes are located under the Turnpike and are parallel to the Turnpike. The gas lines are 36" from the Tampa to Orlando area. High-pressure pipes take a long time to relocate. Overhead electric: 230 kV transmission lines take a long time to relocate. Higher voltages also take more work. Underground electric: usually retired in place. There are usually only minor adjustments, since there usually is not any slack in the cables. Phone: A length should be included for placing conduit in and out of service. Fiber optic cable activities should include rerouting and replacing fiber cable. (Splicing is time extensive.) The preparatory work can take a while. Sewer: cost and time are a function of depth. You also need to maintain a certain slope. Water: should use 4" or 8" pipes since fire hoses usually take a 4" line. Some fire hoses use larger pipe sizes."

The list was then refined even further from discussion with a utility engineer. The resulting list is also listed in Appendix Two.

SOLICITATIONS FOR DATA

The next step in the information gathering process was to approach the Florida Utilities Coordinating Committee (F.U.C.C.) to obtain data from various companies and different areas of the state. The mission statement of the F.U.C.C. is "to promote the effective and equitable co-existence of utilities to create a successful working relationship among and between utilities, and other entities through coordination, cooperation and communication. It is the intent of this Committee to achieve this purpose through frank and impartial consideration of all matters referred to it with full recognition of the respective rights and obligations of the organizations concerned. It is the further intent of the Committee to participate, when practicable, in the preparation of practices, policies, procedures and rules originating with governmental organizations that may affect utility work." The decision to approach the F.U.C.C. was to facilitate the inclusion of all regions of Florida and the variety of companies within each utility industry in this research.

The committee's reaction to the research objective was mixed. Most utility representatives were very concerned that the reference manual would later be used as a tool to determine the responsibility for delays in utility relocation construction projects. The bulk of this reaction came from the cable, electric, and phone companies. However, some individuals were willing to comply with the FDOT's request for information since they felt the outcome could aid the FDOT and their company. These individuals, however, were a small minority of

utility representatives present at the F.U.C.C. meetings. See Appendix Three for a copy of the request for information.

At the last F.U.C.C. meeting the research team attended, the gas industry representatives formed a subcommittee and collaborated on the low, average, and high durations and influencing factors for the list of common activities. Four different companies were represented from the cities of Jacksonville, Tallahassee, Tampa, and Palm Beach. At the same meeting, a water representative supplied the data for the common water activities. The water information represents the city of Tampa. All of these results can be seen in Appendix Four.

After the meeting, two members of the electric industry were willing to share their information. They represent two different companies from St. Petersburg and Gainesville. The Gainesville company also performs cable and gas services and shared that information as well. These results can also be seen in Appendix Four.

Other utility representatives from the phone, cable, water, sewer, and electric industries offered to share their information, but their data has not been received at this time. The research team tried to obtain data from at least three different utility companies from each category, but that level of compliance is not yet received.

EVALUATION AND VERIFICATION OF DATA

Before comparing the information received to the information already gathered in the utility relocation schedules, the activity durations in the utility relocation schedules were calibrated to the standard lengths used in the common utility relocation list. See Appendix Five. There is currently enough information to compare data for gas, electric, phone, and some cable and water activities. The following data will be compared: information from the relocation schedules (some activities will not have data since the activities were added by a district engineer's request), information received from utility professionals, and information from means manuals where possible.

The best way to compare this data would be to compare the average durations for each information source for each utility relocation activity. The results can be seen in Appendix Six.

Comparisons for Electric Relocations

The industry that has sent in the most responses is the electric industry. The research team has received information from four different companies. The data for the overhead electric activities is very similar in scale. The relocation schedule data has the largest allocation of time for most of these activities, except for the activity "removal of fifty feet of aerial cable". For removal of fifty feet of aerial cable, Company B may be including extra set-up time in their estimates or may be using different construction techniques. The data for the

underground electric activities is very similar in scale as well. In this scenario, though, the relocation schedule tends to be lower than the estimates given by the companies. This may reflect more preparation time in a company's estimate.

Comparisons for Gas Relocations

THIS DATA WAS RECEIVED IN TWO DIFFERENT FORMATS: AS A GROUP REPRESENTING THREE DIFFERENT COMPANIES AND AS AN INDIVIDUAL COMPANY'S RESPONSE. THIS INFORMATION IS VERY SIMILAR IN SCALE. HOWEVER, THE INFORMATION FOR ACTIVITY SEVEN THAT THE GROUP GAVE—LOWER ONE HIGH-PRESSURE GAS LINE—IS TWO TIMES THE DURATION THE INDIVIDUAL GAVE. THIS DISCREPANCY MAY BE THE RESULT OF USING DIFFERENT CONSTRUCTION TECHNIQUES OR IT MAY BE A REFLECTION OF PADDING TIMES WITHIN THE INDUSTRY. MORE INFORMATION IS NECESSARY IN ORDER TO MAKE A REASONABLE ANALYSIS.

Comparisons for Phone Relocations

The information received from Company A is similar in scale to the relocation schedules. Since a district utility engineer requested that the research team include many activities not in the relocation schedules, there is not much material to compare. Therefore, more information from other companies would be needed to make a thorough analysis.

Comparisons for Water Relocations

For activities one, two, three, six and seven the construction times are similar in scale between the relocation schedule, means manuals, and Company B. For activity five, remove and replace fifty linear feet of X-inch WM, Company B

included the thirty days required to obtain Department of Environmental Protection permits. If the permit time was not included, then the construction information from Company B would be approximately the same as the information from the means manual. Activities eight and nine, remove and replace one water meter and relocate one water meter, have durations approximately ten times larger than the relocation schedule. Company B elaborated on this information by stating that large water meters are in large vaults which increase construction times. Company A's numbers were more conservative throughout the data. The engineer who gave out that information stated that he did not have much experience with utility relocations. More information from other companies would help verify this information.

Comparisons for Cable Relocations

The research team did not find distinctly comparable data for these activities in the means manual. Activities three and six are not performed by Company A. This leaves the research team very little information to compare. The information that is available is similar in scale. More data is needed in order to verify and analyze these activities.

Comparisons for Sewer Relocations

Three of these activities had comparable scenarios in the means manual. This information is approximately the same as the information in the relocation schedules. Company A has information that follows the relocation schedules for activities 6, 7, and 8. Otherwise, company A's data is very conservative and is

approximately three times higher than the time given in the relocation schedule. However, the engineer who gave information stated that he did not have much experience in utility relocations. More information is needed for this category of activities.

Comparison between Relocation Schedule and Actual On-site Time

The main objective of this research was to obtain low, average and high durations for the common utility activities. In spite of this, daily engineer's reports were gathered for a project containing phone, water, cable, and electric relocations. According to the relocation schedules, the water activities would take 34 days, the phone activities would take 204 days, one electric company would take 90 days, another electric company would need 183 days, and a cable company did not give times since they would just be relocating their new cable to the new electric pole line. The daily engineer's reports showed that this extensive amount of time was not necessary for these relocations. The resulting construction site durations were as follows: 12 days for water relocations (out of 34), 67 days for phone relocations (out of 204), 90 days for one electric company (out of 100), 51 days for another electric company (out of 183 days) and 3 days for the cable company (an initial duration was not given). Except for the first electric company's estimate, the estimated durations on the relocation schedules were approximately three times the actual on-site durations. See Appendix Seven.

This padding of the time necessary to be on the project site could be a reflection of the following scenarios: allocation of weather delays, anticipation of a labor shortage, anticipation of equipment availability, reflection of a contractor's work schedule, anticipated problems with the design, a reflection of the time required to obtain necessary permits for the work, etc. Delving into the possible reasons why the estimated times are approximately three times larger than needed, however, would be a large undertaking and fall under a separate category of research. Nonetheless, the research team wanted to make at least one look at the time on the relocation schedules and the time on the daily reports in order to get an idea of the accuracy between the two entities.

COMPILING THE REFERENCE MANUAL

In order to understand the utility relocation construction process, the research team visited various construction sites and consulted with the local labor force on their construction techniques and productivity rates. The research team observed the following activities: the setting of electric poles, the laying of a six-inch gas line, and the splicing of telephone cable. The labor force gave productivity rates for setting electric poles and laying a six-inch gas line.

The crew that set poles stated that they could set 10 – 12 wood poles a day (ten-hour day) when they are not working within the overhead electric zone. Working within the overhead electric zone would decrease productivity by at least fifty percent.

The crew that worked on the gas line stated that they laid an average of 240 – 300 linear feet of pipe a day. They said that in the previous day they had laid 1000 linear feet of pipe and that the most they had accomplished in a day was one-half of a mile. (They did not mention the number of crews working on these projects.) The welders on this project stated that they had completed 120 welds on the previous day (ten-hour work day) and had completed 92 welds within eight hours of the current day.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From our comparisons between the relocation schedules and the utility companies' information earlier in this report, the research team has determined that overall the relocation schedules are generally a reasonable estimate of the time required to relocate utilities in FDOT construction projects. However, more information and cooperation is needed from the different utility industries in order to refine the information from the relocation schedules. This report may aid as a template for future research.

There are many possible explanations for the inconsistency in the comparison of time requested on the relocation schedule and the actual time required as indicated by the engineer's daily reports. The discrepancies could be the result of the following scenarios:

- Relocation times requested by utilities include time allowances for preliminary activities such as permitting and engineering in addition to the actual relocation time on site
- Relocation times requested by utilities are conservative including contingencies for unexpected events

The relocation of utilities remains a critical component of many FDOT construction projects. The management and coordination of the utility relocation is a key factor in project success. The best possible estimate of relocation time is necessary for project scheduling.

Recommendations

Members of the Florida Utility Coordinating Committee (F.U.C.C.) suggested that the FDOT create a hypothetical project with plans that highlight their main utility relocation concerns. F.U.C.C. members then stated that they would be willing to mark plans and create relocation schedules in such a scenario. They said that they would feel more comfortable giving times for a specific situation with a mapped scenario than what they felt was a general list of activities.

The research team offers the following recommendation to the FDOT for developing a more comprehensive utility relocation management strategy. Since the subject of utilities on FDOT projects involves many different project participants; FDOT project personnel, the utilities, the contractor and FDOT utility engineers, a comprehensive strategy must include input from all participants. Improvements are possible in all aspects of the process: coordination techniques including setting the relocation time, improving the utility instructions and information on the project plans and relocation schedules, and efficient use of Subsurface Utility Engineering. The research team recommends that a comprehensive strategy be developed by a team in which all project participants are represented.

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Dr. Charles Glagola, University of Florida

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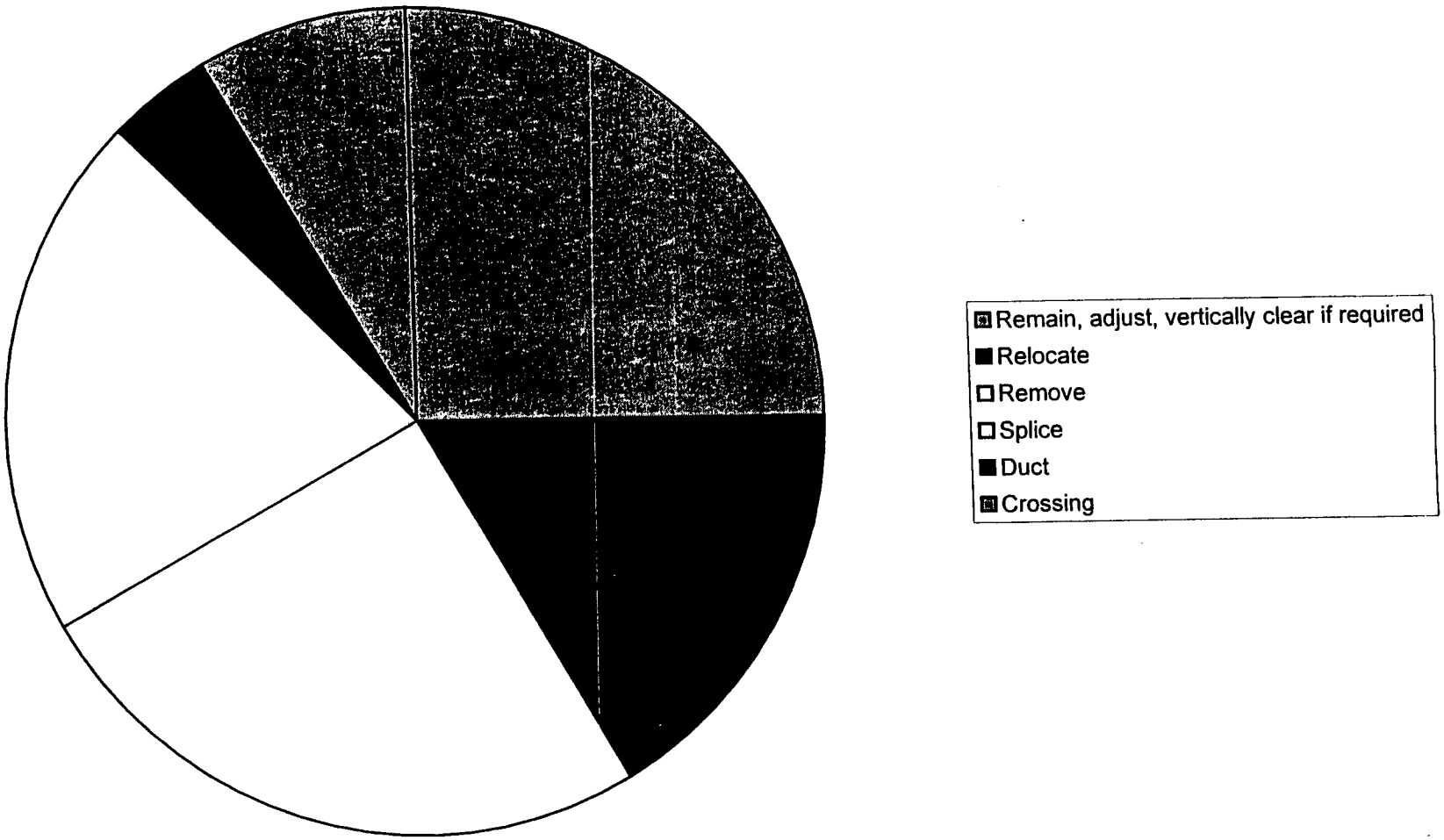
APPENDIX ONE: INVENTORY OF PROJECTS FOR RESEARCH

Project (old)	Project	Relocation Schedule	Plans	Utility Type	Activity	Utility Agency/Owner	Donor of Info	District	Notes
26030-6519		yes	no	buried cable	Locate and protect	Bellsouth Telecommunications, Inc.	BellSouth	District 2	
	20847815201	yes	no	buried cable	Locate and protect, Place out of service, Place in service	Bellsouth Telecommunications, Inc.	BellSouth	District 2	
34040-6510		yes	no	buried cable	Locate and protect, To remain--out of service	Bellsouth Telecommunications, Inc.	BellSouth	District 2	
26070-6573		yes	no	buried cable	Remain in place, adjust as needed	Bellsouth Telecommunications, Inc.	BellSouth	District 2	
26070-3568	20775815201	yes	yes	buried cable	Cut out of service, adjust as necessary, placed in & out of s	Bellsouth Telecommunications, Inc.	BellSouth	District 2	
	21229615201	yes	no	buried cable	Locate and protect	Alltell Florida, Inc.	FDOT-D2 (MR)	District 2	**No longer relocating utilities (TC)
	21229615201	yes	no	gas transmission pipeline	Remain in place	Florida Gas Transmission	FDOT-D2 (MR)	District 2	**No longer relocating utilities (TC)
	21229615201	yes	no	electric	Remain, adjust, install	Florida Power & Light	FDOT-D2 (MR)	District 2	**No longer relocating utilities (TC)
	21229615201	yes	no	water main	Locate	Town of Interlachen	FDOT-D2 (MR)	District 2	**No longer relocating utilities (TC)
	21229615201	yes	no	aerial copper cables	Remain in place	Bellsouth Telecommunications, Inc.	FDOT-D2 (MR)	District 2	**No longer relocating utilities (TC)
	20783515201	yes	no	electric	Protect as needed	GRU-electric	FDOT-D2 (MR)	District 2	**Is not significant (TC)
	20783515201	yes	no	gas transmission	Remain in place, relocate existing test site	Florida Gas Transmission	FDOT-D2 (MR)	District 2	**Is not significant (TC)
	20783515201	yes	no	fiber optic cable	Locate and protect	Cox Communications	FDOT-D2 (MR)	District 2	**Is not significant (TC)
	20783515201	yes	no	water and wastewater	Locate, adjust, and relocate	GRU-water/wastewater	FDOT-D2 (MR)	District 2	**Is not significant (TC)
	20783515201	yes	no	gas main	Locate and protect	GRU-gas	FDOT-D2 (MR)	District 2	**Is not significant (TC)
78060-3505	21023615201	yes	yes	electric	Adjust, change, locate and protect, remain	Florida Power & Light	FDOT-D2(TC)	District 2	
	21054115201	yes	yes	fiber optic cable	Relocate	MCI/Worldcom Network Services, Inc.	FDOT-D2(TC)	District 2	
	21054115601	yes	yes??	fiber optic cable	Relocated to greater depth	MCI/Worldcom Network Services, Inc.	FDOT-D2(TC)	District 2	
39020-6525	21096815201	yes	yes	electric overhead lines	Remain, relocate, adjust	Florida Power & Light	FDOT-D2(TC)	District 2	
39020-6525	21096815201	yes	yes	cables--aerial and buried	Remain, install new facilities, and lower a fiber	Alltell Florida, Inc.	FDOT-D2(TC)	District 2	
14090-3522/	25634315201	yes	yes	forced main & water main	Remain; connect; furnish, install, &test; remove	Pasco Co. Utilities	FDOT-D7 (JR)	District 7	
14090-3522/	25634315201	yes	yes	14.4 kV overhead electric	Remain in place, relocate as needed	Withlacoochee River Electric Coop., In	FDOT-D7 (JR)	District 7	
14090-3522/	25634315201	yes	yes	150 mm steel gas main	Remain in place, support main in place	TECO Peoples Gas	FDOT-D7 (JR)	District 7	
14090-3522/	25634315201	yes	yes	coaxial fibers	Remain in place, remove & tie into existing lines, adjust exi	FSN Cable TV, Inc.	FDOT-D7 (JR)	District 7	
14090-3522/	25634315201	yes	yes	100 mm conduits	To be constructed, to remain in place, to be removed	GTE Florida, Inc.	FDOT-D7 (JR)	District 7	
76060-6503	20996515201	yes	yes	110V electric O/H distribut	removal, crossing to remain, to be constructed	Florida Power & Light	FDOT-D2(TC)	District 2	
76060-6503	20996515201	yes	yes	street light poles	to be constructed	Florida Power & Light	FDOT-D2(TC)	District 2	
76060-6503	20996515201	yes	yes	230kV overhead transmis	remain, to be relocated	Florida Power & Light	FDOT-D2(TC)	District 2	
76060-6503	20996515201	yes	yes	3/4" service line & 2" gas l	to be lowered, to be taken out of service, to be protected, et	Palatka Gas Authority	FDOT-D2(TC)	District 2	
76060-6503	20996515201	yes	yes	O/H cable	to remain and be located to new poles	Time Warner Cable	FDOT-D2(TC)	District 2	
76060-6503	20996515201	yes	yes	3 phase overhead facilitie	to be removed, to remain, to be constructed	Florida Power & Light	FDOT-D2(TC)	District 2	
34010-3540	21041915201	yes	yes	gas main, sewer man hol	relocate, locate and protect, be removed, etc.	City of Williston	FDOT-D2(TC)	District 2	
34010-3540	21041915201	yes	yes	BT, varying pair #s	place out of service, directional bore, etc.	Sprint Florida, Inc.	FDOT-D2(TC)	District 2	
34010-3540	21041915201	yes	yes	25 K/V line	remove on right side, remain & relocate	Central Florida Electric Corp., Inc.	FDOT-D2(TC)	District 2	
75120-6506	23925515201	yes	no	steel and plastic pipe of v	remain in place, lower in place, placed out of service, adjus	Lake Apopka Natural Gas District	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	sanitary force main and s	remain in service, plugged and placed out of service, etc	City of Apopka	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	O/H 230 kv transmission li	monitor	FL Power Corp.--Transmission	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	aerial fiber optic cable	relocate & remove existing aerial	Time Warner Communications	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	BT # PR/	remain, adjust frame and cover; designate & locate	Sprint Florida Inc.	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	12.47 kv aerial	relocate, remove, provide temporary support	FL Power Corp.--Distribution	FDOT-D5(JN)	District 5	
75120-6506	23925515201	yes	no	gas main crossing	to remain	FL Gas Transmission Co.	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	ducts & manholes	none, adjust frame & cover; place out of service	Bellsouth	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	coax cable & support stra	remain, be removed, proposed new	TCI Cablevision of FL, Inc.	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	gas main	remain, place out-of-service, be adjusted	TECO Peoples Gas System	FDOT-D5(JN)	District 5	

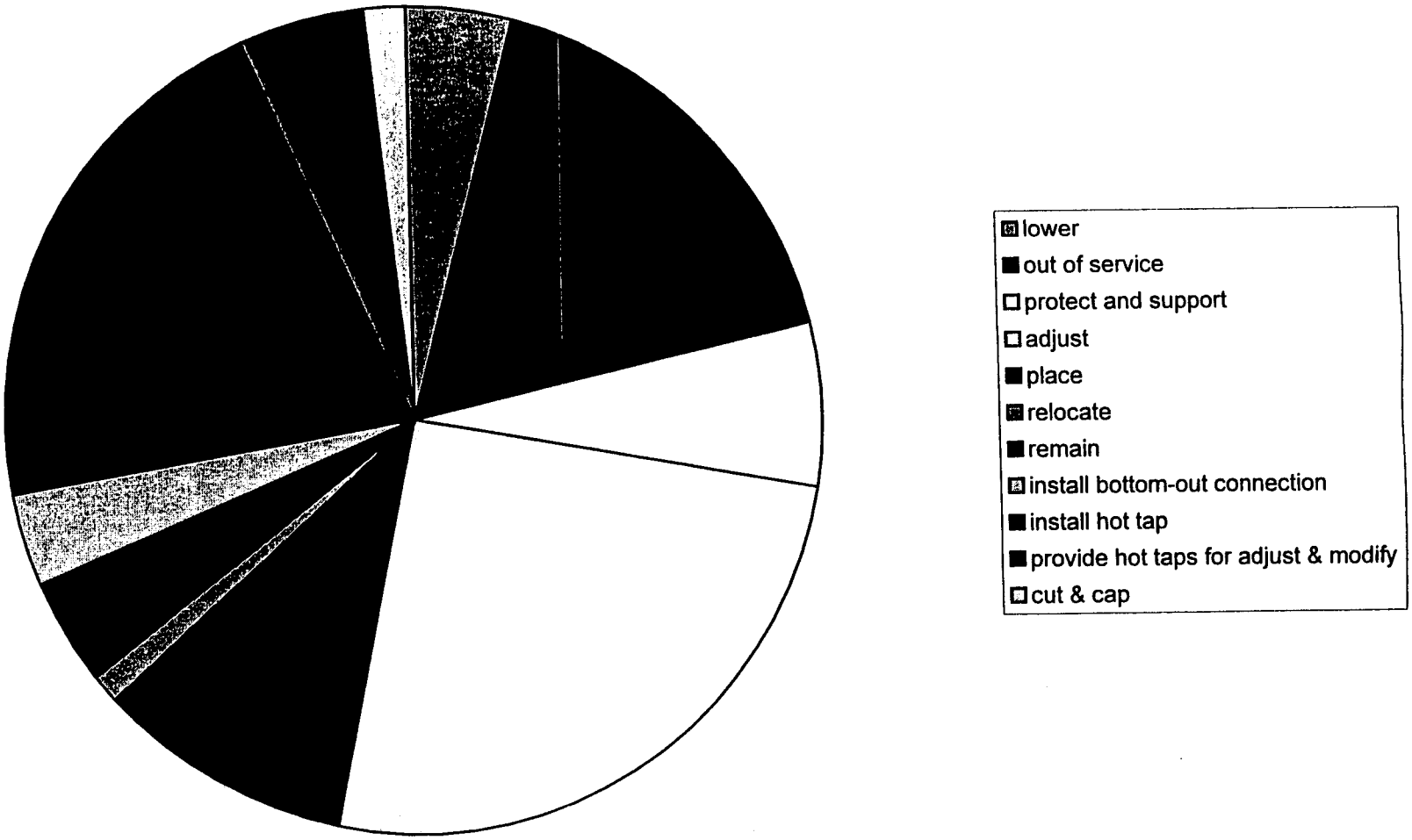
Project (old)	Project	Relocation Schedule	Plans	Utility Type	Activity	Utility Agency/Owner	Donor of Info	District	Notes
79080-6544	24092215201	yes	yes	Water meter	remove	City of Daytona Beach	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	aerial conductors and pol	remain, remove, rework, install, adjust	FL Power & Light Distribution	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	sanitary manhole, water v	adjust to grade, furnish & install, remove, grout fill	City of Daytona Beach	FDOT-D5(JN)	District 5	
79080-6544	24092215201	yes	yes	double circuit undergroun	install as required	FL Power & Light Distribution	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	gas main	install, place out-of-service	TECO/Peoples Gas	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	12.47 kv O/H	replace, remove, relocate	FL Power & Light Distribution	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	underground telephone, t	place out of service, construct, adjust to final grade	Sprint--Florida Inc.	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	high pressure nat gas tan	install insulation board over P/L	FL Gas Transmission Co.	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	13.2 kv O/H electric	remain, replace, remove, reconductoring, construct	Kissimmee Utility Authority	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	underground coaxial & fib	none, place & pull new cable through	Time Warner Communications	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	6 count fiber optic	locate & protect	Adelphia Cable/Telesat Cablevision	FDOT-D5(JN)	District 5	
92090-6543	23967015201	yes	yes	??Lt & RT	R&R, pipe clearance	City of Kissimmee--Water/Sewer	FDOT-D5(JN)	District 5	

APPENDIX TWO: DEVELOPMENT OF COMMON UTILITY RELOCATION LIST

Cable Activities



Gas Activities

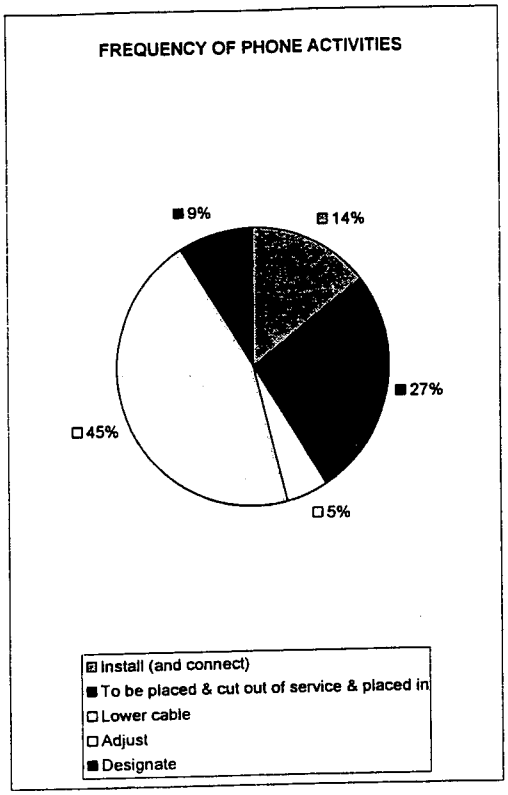


Development of a Utility Production Rate Scheduling Reference for FDOT Construction Projects
Contract No: BC354 (RPWO #3)
UF Project No: 4910450471512

Prepared By: Michael Shane Johnson
8/11/00

PHONE DATA

Frequency	Activity	Estimated time to Complete
	Install (and connect)	
1	Place 1 50pr cable, directional bore 4" sdr	5.0
1	Place 1 50pr cable, directional bore 4" sdr	4.0
1	Place 1 25pr cable, directional bore 4" sdr	4.0
1	Place 1 25pr cable	2.0
1	Place 1 25pr cable, directional bore 4" sdr	4.0
1	Place 1 25pr cable	1.0
1	Place split 4" conduit 5m L & R of CL	3.0
3	Extend 4" blk iron pipe w/split 4" conduit	3.0
1	Place cable MTD 4 way 100 PVC HH & duct	162.0
1	Cable w/crossing 4 way 100 PVC HH & duct	184.0
1	Cable MTD 8 way 100 PVC HH & duct	38.0
1	Directional bore 4" sdr	4.0
2	Install cable & place exist out of service	10.0
2	Install cable & place exist out of service	20.0
1	Install facilities & place exist out of service	10.0
1	Install cable & place exist out of service	22.0
1	Relocate cables 1.5m W (1-600pr,1-100pr)	2.0
	To be placed & cut out of service & placed in	
1	Place cable out of service (100pr)	1.0
1	Place cable out of service (50pr)	5.0
1	Place in service (4" sched 40 PVC)	INCL 14
1	Place out of service (4" sched 40 PVC)	INCL 14
1	Cut out of service (900pr, 150pr, 100pr)	INCL 14
1	Place out of service (4" sched 40 PVC)	INCL 14
1	Place in service (4" sched 40 PVC)	INCL 14
1	Cut out of service (12fiber, 50pr, 100pr, 900pr)	INCL 14
3	Cut out of service (100pr)	INCL 14
1	Cut out of service (12fiber)	INCL 14
2	Cut out of service (200pr)	INCL 14
3	Cut out of service (25pr)	INCL 14
2	Cut out of service (300pr)	INCL 14
1	Cut out of service (400pr)	INCL 14
5	Cut out of service (50pr)	INCL 14
1	Place in service (50pr)	INCL 14
2	Cut out of service (fiber)	INCL 14
1	*Place in service (200pr) arial attach	10.0
1	Place in service (MH 8'x4'x6')	2.0
2	Place out of service	4.0
1	Place out of service (300pr)	45.0
1	Place out of service (25pr)	PT OF 300
1	Place out of service (50pr)	PT OF 300
1	Place out of service (1122pr, 1212pr, 2700pr)	PT OF 300
1	Place cable out of service (50pr)	1.0
1	Place cable out of service (1bt-6pr)	1.0
1	Cut out of service (18fiber)	18.0
	Lower cable	
1	Lower 24" (400pr)	2.00
1	Lower 1m (600pr)	1.00
1	Lower 0.5m (600pr)	2.00
1	Lower 1m	4.00
1	Lower 1.4m (1-400pr, 1-100pr)	2.00
1	To be relocated to gtr depth	8.00
1	Lower 30"	3.00
	Adjust	
1	Adjust frame & cover to new prop elevation	5.0
9	Adjust frame & cover (8-4"ducts & manhole)	2.0
1	Adjust frames	5.0
1	Adjust as needed (to remain in place)	5.0
1	Adjust offset as needed (25pr)	5.0
1	Adjust grade as needed (25pr)	5.0
1	Adjust as needed (600pr) (to remain in place)	10.0
1	Adjust as needed (600pr) (to remain in place)	5.0
1	Adjust as needed (600pr) (to remain in place)	3.0
1	Adjust as needed (900pr) (verify out of service)	5.0
1	Adjust as needed (conduit/300pr) (to remain in	5.0
2	Adjust frame & cover (to remain active)	2.0
1	Adjust frame & cover (to remain active)	6.0
2	Adjust as nec. (cover)	1.0
41	Adjust to final grade (telephone handhole)	1.0
	Designate	
1	Designate (4 duct)	10.0
11	Designate w/paint and stakes	1.0
1	Clearing and grubbing & R/W staked	10.0

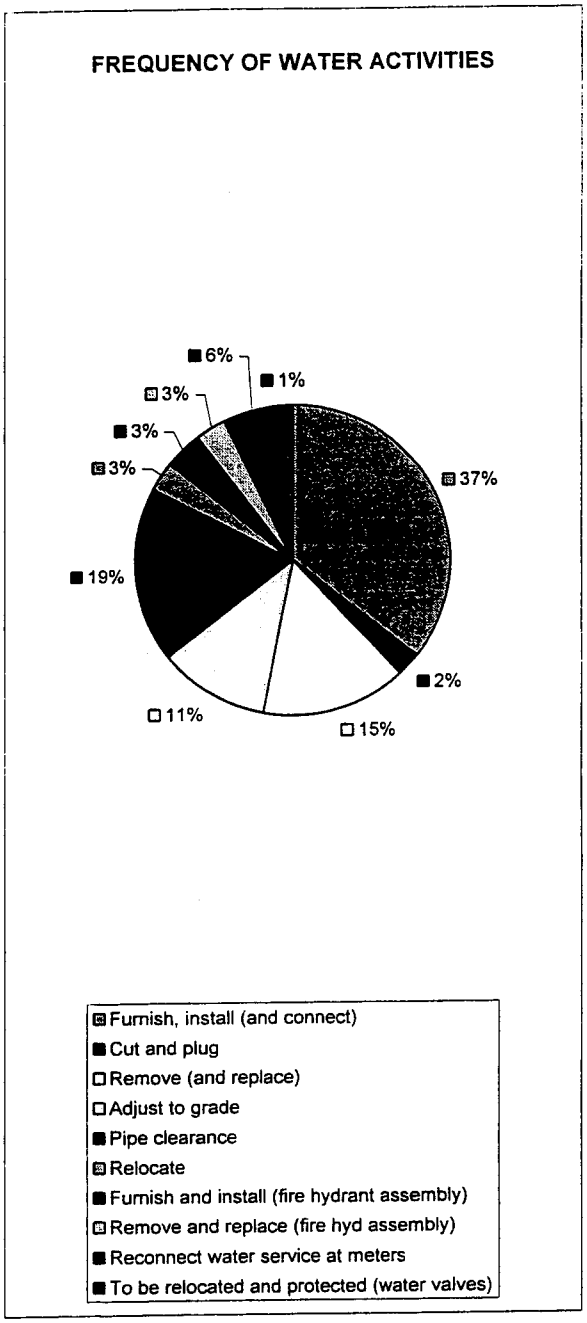


Development of a Utility Production Rate Scheduling Reference for FDOT Construction Projects
Contract No: BC354 (RPWO #3)
UF Project No: 4910450471512

Prepared By: Michael Shane Johnson
8/11/00

WATER DATA

Frequency	Activity	Estimated time to Complete
	Furnish, install (and connect)	
1	152 mm DI PC 350 WM (and connect)	1.00
8	Type K Copper (and connect)	3.00
8	Type K Copper (and connect)	0.30
1	Type K Copper (and connect)	0.90
1	Type K Copper (and connect)	0.25
1	152 mm ductile iron WM	25.00
1	305 mm DI PC 350 WM	1.00
1	305 mm DI PC 350 WM	0.40
1	356 mm plug	0.25
1	356 mm plug/152 mm tapping sleeve/valve	0.40
1	356 mm/356 mm tapping sleeve/valve	0.40
1	610 mm ductile iron WM	17.00
1	400 DIP WM (and test)	10.00
1	Install WM at service pts	2.00
1	Concrete thrust collar	5.00
1	Connect to existing WM	0.75
1	Connect to existing GV	1.00
	Cut and plug	
1	254 mm plug	0.50
1	356 mm plug	0.50
	Remove (and replace)	
1	152 & 610 mm plugs (and connect to WM)	1.00
1	152 mm cast iron WM	10.00
1	254 mm cast iron WM	3.00
1	356 mm cast iron WM	7.50
1	356 mm cast iron WM	12.50
4	Remove (water meter)	0.25
4	Remove (water meter)	1.00
10	**Adjust to grade**	0.25
16	**Pipe clearance**	1.00
	Relocate	
1	Water meter	0.25
1	Water meter	0.15
1	Water meter	2.00
3	**Furnish and install (fire hydrant assembly)**	0.35
2	**Remove and replace (fire hyd assembly)**	0.50
1		5.00
1	**Reconnect water service at meters**	1.00
2		2.00
3		3.00
4		4.00
5		5.00
1	**To be located and protected (water valves)**	1.00

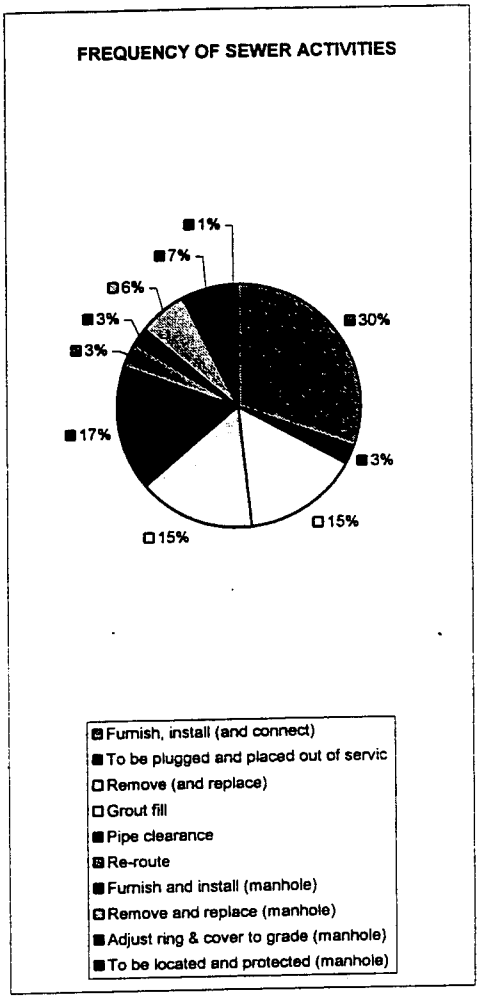


Development of a Utility Production Rate Scheduling Reference for FDOT Construction Projects
Contract No: BC354 (RPWO #3)
UF Project No: 4910450471512

Prepared By: Michael Shane Johnson
8/11/00

SEWER DATA

Frequency	Activity	Estimated time to Complete
	Furnish, install (and connect)	
11	152 mm PVC SDR 35 (and connect)	3.0
11	152 mm PVC SDR 35 (and connect)	0.3
1	203 mm PVC SDR 35	4.0
1	203 mm PVC SDR 35	3.0
1	203 mm PVC SDR 35	2.5
1	254 mm PVC SDR 35 (w/outside drop)	1.0
1	100 PVC FM (and test)	3.0
1	200 PVC FM (and test)	10.0
2	300 PVC FM (and test)	10.0
6	Connect existing to new	1.0
	To be plugged and placed out of service	
1	10" san. sewer	30.0
1	8" san sewer	30.0
1	4" FM	14.0
	Remove (and replace)	
1	100 FM (and replace)	2.0
1	150 FM (and replace)	30.0
1	152 mm PVC SDR 35 (and replace)	1.0
1	254 mm (and replace)	4.0
1	San sewer main (and replace)	0.5
1	San sewer main	0.3
1	203 mm cast iron	2.0
1	203 mm concrete	3.0
2	100 PVC FM	1.0
1	200 PVC FM	5.0
2	200 PVC FM	1.0
1	200 PVC FM	30.0
1	203 mm concrete	3.0
1	203 mm concrete	2.0
1	203 mm PVC	0.5
1	203 mm PVC	4.0
18	**Grout fill**	0.5
20	**Pipe clearance (150, 200, 300, 400)**	1.0
	Re-route	
1	150 FM	1.0
2	300 FM	1.0
1	300 RM	2.0
3	**Furnish and install (manhole)**	1.0
	Remove and replace (manhole)	
1	Remove and replace	3.5
6	Remove	1.0
7	**Adjust ring & cover to grade (manhole)**	0.5
1	Raise (manhole)	5.0
1	**To be located and protected (manhole)**	5.0



Original List of Common Utility Activities

Cable:

1. Remain, adjust, and vertically clear (1) fiber optic aerial cable if required.
2. Place and pull new coaxial cable (6 mm, 13 mm, and 19 mm) through 103 mm duct.
3. Splice and activate new coaxial cable (6 mm, 13 mm, and 19 mm).
4. Directional bore (1-800 m) 103 mm duct.
5. Relocate 1" coaxial, .50 and .75 coaxial 1-26 count fiber overhead cable to new poles.
6. Remove (1) existing underground amplifier and power supply.
7. Remove (1-6.5 m length) .750 M.C. existing cable.
8. Remove existing overhead cable (40 m length of 6 mm, 13 mm, and 19 mm strands).
9. Remove existing .750 M.C. crossing (1-40 m length).

Gas:

1. Protect and support (1-10 lf) 2" line (60 PSI).
2. Adjust (1) 2" steel pipe.
3. Lower one ¾" service line in place.
4. Install one new 2-inch gas line per 50 linear feet.
5. Provide (1) hot tap for adjustment and modification for (1) 101 mm gas main.
6. Install (1) hot tap for (1) 101 mm gas main.
7. Install one bottom-out connection for one 101 mm gas main.
8. Place out of service (1-50 lf) 4" gas line (60 lbs PSI).

Electric (Overhead):

1. Relocate (1-100 lf) 120 V aerial line.
2. Relocate (1) pole for 12.47 kV line.
3. Remove (1) overhead electric crossing for a 13.2 kV line.
4. Remove (2-350 m) of aerial cable.
5. Remove poles for (1-720 lf) 7.6 kV aerial crossings.
6. Provide service for traffic signal.

Electric (Underground):

1. Remove (2-160 m) buried cables.
2. Place 8-100 mm conduits for 328 lf (100 m).
3. Remove (1) fiber optic cable from conduit for 1230 lf (375 m).
4. Remove 3-100 mm conduits for 1148 lf (350 m).
5. Adjust 3-100 mm existing conduits and (2) buried cables to facilitate installation of (1) 450 mm pipe.
6. Place (1) type A pre-cast manhole.

Phone:

1. Install and connect 100 lf of copper cable.
2. Install and connect 100 lf of fiber cable.
3. Cut (1-100 lf) 900-pr cable out of service.
4. Place (1) 4" sched. 40 PVC conduit out of service.
5. Place (1) 4" sched. 40 PVC conduit in service.
6. Place (1) 50-pr cable out of service.
7. Lower (50 lf) of 600-pr cable.
8. Install and connect (1) handhole.
9. Adjust (1) telephone handhole to final grade.
10. Adjust frame and cover for (1) manhole.

Sewer:

1. Furnish, install, and connect (500 lf) of 0.6" (152 mm) PVC SDR.
2. Furnish, install, and connect (500 lf) of 300 PVC FM.
3. Remove and replace (500 lf) of 100 PVC FM.
4. Remove and replace (500 lf) of sanitary sewer main.
5. Plug and place out of service (1) 8" sanitary sewer main.
6. Re-route (500 lf) of 300 FM.
7. Pipe clearance for (1) 150 PVC FM.
8. Grout fill (1) 0.4" (102 mm) sanitary sewer lateral.
9. Furnish and install (1) manhole.
10. Adjust ring and cover to grade for (1) manhole.

Water:

1. Furnish, install, and connect (500 lf) of Type K copper pipe.
2. Cut and plug (1) 10" (254 mm) pipe.
3. Adjust (1) water valve box to grade.
4. Pipe clearance for (1) 200 WM.
5. Remove and replace (500 lf) of 1.4" (356 mm) cast iron WM.
6. Furnish and install (1) fire hydrant assembly.
7. Remove and replace (1) fire hydrant assembly.
8. Remove and replace (1) water meter.
9. Reconnect water service at (1) water meter.
10. Relocate (1) water meter.

Final List of Common Utility Categories and Activities

Cable Activities:
1. Adjust or replace one fiber optic aerial cable.
2. Place and pull new coaxial cable through a four-inch duct.
3. Splice and activate new coaxial cable.
4. Directional bore 100 feet for 4-inch duct.
5. Relocate three fiber overhead cables to new poles.
6. Remove one existing underground amplifier and power supply.
7. Remove existing overhead cable per 100-feet.
8. Remove existing cable crossing per span.

Gas Activities:
1. Protect and support ten linear feet of one low pressure gas line.
2. Adjust one 2-inch steel pipe.
3. Lower one ¾" service line in place.
4. Install one new 2-inch gas line per 50 linear feet.
5. Install one bottom-out connection for one 4-inch gas main.
6. Place out of service one 4-inch gas line per fifty linear feet.
7. Lower one high-pressure gas line.
8. Encase one high-pressure gas line.

Electric Activities (Overhead):
1. Relocate per span one 13 kV line.
2. Relocate one pole for 12.47 kV line.
3. Remove one overhead electric crossing for a 13.2 kV line.
4. Remove fifty feet of aerial cable.
5. Provide service for street light load center (480 V).
6. Remove poles for an aerial crossing.
7. Provide service for traffic signal (120 V).

Electric Activities (Underground):
1. Remove three buried cables per fifty feet.
2. Place duct bank X by Y of Z-inch conduit for fifty feet.
3. Remove 3-100 mm conduits for fifty feet.
4. Adjust existing electric conduits.
5. Place pre-cast manhole.

Phone Activities:
1. Install and splice 100 linear feet of buried copper cable.
2. Install and splice 100 linear feet of buried fiber cable.
3. Install and splice 100 linear feet of aerial copper cable.
4. Install and splice 100 linear feet of aerial fiber cable.
5. Install and splice 100 linear feet of copper cable in conduit.
6. Install and splice 100 linear feet of buried fiber cable in conduit.
7. Place fifty feet of X-pair cable out of service.
8. Place (1) 4" sched. 40 PVC conduit out of service.
9. Place (1) 4" sched. 40 PVC conduit in service.
10. Lower fifty linear feet of X-pr cable.
11. Install and connect one handhole and duct system.
12. Adjust one telephone handhole to final grade.
13. Adjust frame and cover for one manhole.
14. Splice one 900-pair cable.

Sewer Activities:
1. Furnish, install, and connect fifty linear feet of X-inch PVC SDR.
2. Furnish, install, and connect fifty linear feet of X-inch PVC FM.
3. Remove and replace fifty linear feet of X-inch PVC FM.
4. Plug and place out of service one 8-inch sanitary sewer main.
5. Re-route fifty linear feet of X-inch PVC FM.
6. Grout fill one X-inch sanitary sewer lateral for fifty linear feet.
7. Furnish and install one manhole.
8. Adjust ring and cover to grade for one manhole.

Water Activities:
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.
2. Cut and plug one X-inch pipe.
3. Adjust one water valve box to grade.
4. Adjust one X-inch WM.
5. Remove and replace fifty linear feet of X-inch WM.
6. Furnish and install one fire hydrant assembly.
7. Remove and replace one fire hydrant assembly.
8. Remove and replace one water meter.
9. Relocate one water meter.

APPENDIX THREE: REQUEST FOR INFORMATION TO THE FLORIDA UTILITIES COMMITTEE

University of Florida
Research Project

DEVELOPMENT OF A UTILITY PRODUCTION RATE SCHEDULING REFERENCE FOR FDOT CONSTRUCTION PROJECTS

Thank you for your consideration in assisting us in producing a manual of production rates of typical utility relocations. To continue with our present research objectives, we first need to verify the activity lists we have generated as representative tasks for each utility type. We feel your cooperation and input with our project will eventually lead to a more collaborate effort between all parties involved in utility relocation. A sample of our current activity lists for each utility category is attached.

If you would like to assist us, please fill in the columns labeled "Common Duration in Your Experience" in the sheets provided, using your knowledge and experience of characteristic durations for typical utility activities. If you would like to fill this in and fax it to us, please feel free to send it to number below. If you prefer an electronic format, we can email you the attached list for your convenience.

Again, thank you for your time and consideration in this matter. Your help is greatly appreciated. If you have any questions, please feel free to contact any of us at:

Jennifer Shannon	(352) 846-1246	jenshannon@con-eng.com
Mike Johnson	(352) 392-8487	mikeshanejohn@hotmail.com
Dr. Ralph Ellis	(352) 392-3730	relli@ce.ufl.edu
Fax	(352) 392-8487	

Please give us your contact information in case we need to get in touch with you.

Name _____

Company _____

Phone _____

Email _____

Address _____

_____

Utility Categories and Activities:

Cable Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Adjust or replace one fiber optic aerial cable.				
2. Place and pull new coaxial cable through a four-inch duct.				
3. Splice and activate new coaxial cable.				
4. Directional bore 100 feet for 4-inch duct.				
5. Relocate three fiber overhead cables to new poles.				
6. Remove one existing underground amplifier and power supply.				
7. Remove existing overhead cable per 100-feet.				
8. Remove existing cable crossing per span.				

Gas Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Protect and support ten linear feet of one low pressure gas line.				
2. Adjust one 2-inch steel pipe.				
3. Lower one ¾" service line in place.				
4. Install one new 2-inch gas line per 50 linear feet.				
5. Install one bottom-out connection for one 4-inch gas main.				
6. Place out of service one 4-inch gas line per fifty linear feet.				
7. Lower one high-pressure gas line.				
8. Encase one high-pressure gas line.				

Electric Activities (Overhead):	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Relocate per span one 13 kV line.				
2. Relocate one pole for 12.47 kV line.				
3. Remove one overhead electric crossing for a 13.2 kV line.				
4. Remove fifty feet of aerial cable.				
5. Provide service for street light load center (480 V).				
6. Remove poles for an aerial crossing.				
7. Provide service for traffic signal (120 V).				

Electric Activities (Underground):	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Remove three buried cables per fifty feet.				
2. Place duct bank X by Y of Z-inch conduit for fifty feet.				
3. Remove 3-100 mm conduits for fifty feet.				
4. Adjust existing electric conduits.				
5. Place pre-cast manhole.				

Phone Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Install and splice 100 linear feet of buried copper cable.				
2. Install and splice 100 linear feet of buried fiber cable.				
3. Install and splice 100 linear feet of aerial copper cable.				
4. Install and splice 100 linear feet of aerial fiber cable.				
5. Install and splice 100 linear feet of copper cable in conduit.				
6. Install and splice 100 linear feet of buried fiber cable in conduit.				
7. Place fifty feet of X-pair cable out of service.				
8. Place (1) 4" sched. 40 PVC conduit out of service.				
9. Place (1) 4" sched. 40 PVC conduit in service.				
10. Lower fifty linear feet of X-pr cable.				
11. Install and connect one handhole and duct system.				
12. Adjust one telephone handhole to final grade.				
13. Adjust frame and cover for one manhole.				
14. Splice one 900-pair cable.				

Sewer Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Furnish, install, and connect fifty linear feet of X-inch PVC SDR.				
2. Furnish, install, and connect fifty linear feet of X-inch PVC FM.				
3. Remove and replace fifty linear feet of X-inch PVC FM.				
4. Plug and place out of service one 8-inch sanitary sewer main.				
5. Re-route fifty linear feet of X-inch PVC FM.				
6. Grout fill one X-inch sanitary sewer lateral for fifty linear feet.				
7. Furnish and install one manhole.				
8. Adjust ring and cover to grade for one manhole.				

Water Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Influencing Factors
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.				
2. Cut and plug one X-inch pipe.				
3. Adjust one water valve box to grade.				
4. Adjust one X-inch WM.				
5. Remove and replace fifty linear feet of X-inch WM.				
6. Furnish and install one fire hydrant assembly.				
7. Remove and replace one fire hydrant assembly.				
8. Remove and replace one water meter.				
9. Relocate one water meter.				

APPENDIX FOUR: INFORMATION RECEIVED FROM THE REQUEST FOR INFORMATION

Sewer Activities:	Lowest Duration in Your Experience	Average Duration in Your Experience	Highest Duration in Your Experience	Factors that Contribute to Productivity
	(Days)	(Days)	(Days)	
1. Furnish, install, and connect fifty linear feet of X-inch PVC SDR.	4	14	20	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather
2. Furnish, install, and connect fifty linear feet of X-inch PVC FM.	4	14	20	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather
3. Remove and replace fifty linear feet of X-inch PVC FM.	8	28	40	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather, preparation of trench for new installation, disposal point for old materials, sometimes removal can take more time than installation
4. Plug and place out of service one 8-inch sanitary sewer main	2	4	8	depth of pipe, soil conditions, permitting, weather, availability of labor and equipment
5. Re-route fifty linear feet of X-inch PVC FM	4	14	20	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather
6. Grout fill one X-inch sanitary sewer lateral for fifty linear feet.	3	4	6	depth of pipe, soil conditions, permitting, weather, availability of labor and equipment, contractor availability
7. Furnish and install one manhole	1	4	8	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather
8. Adjust ring and cover to grade for one manhole.	0.5	1	2	soil conditions, permitting, weather, availability of labor and equipment

One day = 10 hours
One week = 4 days

Water Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Factors that Contribute to Productivity
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.	1	1	5	
2. Cut and plug one X-inch pipe.	0.5	1	5	
3. Adjust one water valve box to grade.	0.25	0.25	5	
4. Adjust one X-inch WM.				what size? Do not understand, adjust of linear feet is important.
5. Remove and replace fifty linear feet of X-inch WM.	35	35	60	size? 50 lf 10' deep versus 3' deep--size plus 30 days to get DEP clearances
6. Furnish and install one fire hydrant assembly.	0.5	1	10	
7. Remove and replace one fire hydrant assembly.	1	2	10	
8. Remove and replace one water meter.	4 weeks	4 weeks	8 weeks	size? Large meters are in large vaults
9. Relocate one water meter.	4 weeks	4 weeks	8 weeks	size? Large meters are in large vaults. They don't relocate.

•• Numbers shown do not include restoration of roadway, sidewalk, specialty pavers, brick, and sod.

Water Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Factors that Contribute to Productivity
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.	4	14	20	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather
2. Cut and plug one X-inch pipe.	2	4	8	depth of pipe, soil conditions, permitting, weather, availability of labor and equipment
3. Adjust one water valve box to grade.	0.5	1	2	soil conditions, permitting, weather, availability of labor and equipment
4. Adjust one X-inch WM.	1		4	clearing and grubbing, ordering the material (fabrication), availability of labor and equipment, soil conditions, DOT permits, weather, lowest duration is for a length of 20' or less, the highest duration is for a length of 20' or more, the length of adjustment, vertical or horizontal adjustment
5. Remove and replace fifty linear feet of X-inch WM.	0.5	1	2	soil conditions, permitting, weather, availability of labor and equipment
6. Furnish and install one fire hydrant assembly.	1	3	8	availability of assemblies, perpendicular or parallel to water main, permitting, weather, availability of labor and equipment
7. Remove and replace one fire hydrant assembly.	2	6	16	availability of assemblies, perpendicular or parallel to water main, permitting, weather, availability of labor and equipment, removal time, removal of concrete block at the elbow
8. Remove and replace one water meter.	1	3	4	soil conditions, permitting, weather, availability of labor and equipment
9. Relocate one water meter.	1	3	4	soil conditions, permitting, weather, availability of labor and equipment

One day = 10 hours

One week = 4 days

Gas Activities:	Lowest Duration in Your Experience (Days)	Average Duration in Your Experience (Days)	Highest Duration in Your Experience (Days)	Factors that Contribute to Productivity
1. Protect and support ten linear feet of one low pressure gas line.	0.5	1	2	open excavation, providing temporary support, site conditions, weather conditions, type of material, shoring equipment
2. Adjust one 2-inch steel pipe.				@ storm drainage; length of adjustment and pressure of gas main (Note: this requires welding of fittings.)
3. Lower one ¾" service line in place.	1		2	site conditions and restoration of service
4. Install one new 2-inch gas line per 50 linear feet.	1		2	site conditions, open trench, plastic (Note: this requires tap and service cut over.)
5. Install one bottom-out connection for one 4-inch gas main.	2		4	site conditions, weather, welding, material/supplies
6. Place out of service one 4-inch gas line per fifty linear feet.	2--one way feed		4	install stoppers each end
7. Lower one high-pressure gas line.	3		6	for 4" pipe: open excavation and no other utility conflicts
8. Encase one high-pressure gas line.	6		10	open excavation at R/R & install casing 10' deep

Note: Pressure ratings vary by company

Gas Activities:	Lowest Duration in Your Experience	Average Duration in Your Experience	Highest Duration in Your Experience	Factors that Contribute to Productivity
	(Days)	(Days)	(Days)	
1. Protect and support ten linear feet of one low pressure gas line.				We have no low pressure gas mains.
2. Adjust one 2-inch steel pipe.	1	2	4	length to move, pressure, do we have to make stops& cut in pipe?
3. Lower one ¾" service line in place.	1	1	1	road crossing involved?
4. Install one new 2-inch gas line per 50 linear feet.	0.5	0.5	1	rock involved?
5. Install one bottom-out connection for one 4-inch gas main.	0.5	0.5	1	assuming main is steel
6. Place out of service one 4-inch gas line per fifty linear feet.	0.5	1	2	length of main to purge, steel or plastic main, customers involved?
7. Lower one high-pressure gas line.	1	2	4	steel or plastic
8. Encase one high-pressure gas line.				Not a usual procedure for us

Note: Pressure ratings vary by company.

Cable Activities:	Lowest Duration in Your Experience	Factors that Contribute to Productivity	Average Duration in Your Experience	Factors that Contribute to Productivity	Highest Duration in Your Experience	Factors that Contribute to Productivity
1 Adjust one fiber optic aerial cable	1 hour	adjustment of one wooden pole. fiber optic cable	2 hours	wooden pole, fastening & re-fastening	3 hours	concrete pole, one hour to drill
1 Replace one fiber optic aerial cable	4 hours	defined this activity as install & remove, wood poles, deenergized cable	5 hours	wood poles same drilling time as previous case, energized cable	6 hours	concrete pole
2 Place and pull new coaxial cable through a four-inch duct	We do not use coaxial cable.					
3 Splice and activate new coaxial cable	We do not use coaxial cable.					
4 Directional bore 100 feet for 4-inch duct	1 day	dry, sand, no mud. locates are good	2 days	1 previous failed attempt	4 days	very rocky scenario, utilities unknown, wet conditions
5 Relocate three fiber overhead cables to new poles	6 hours	defined as one span, two poles--just moving time, splicing not included; 1 attachment per cable per pole; rest of the conditions are the same as #1	12 hours	conditions the same as #1	18 hours	conditions the same as #1
6 Remove one existing underground amplifier and power supply	We do not perform this activity.					
7. Remove existing overhead cable per 100 feet	0.4 hours	This activity has been defined as cutting the cable down and rolling it up.	0.5 hours		0.7 hours	traffic, energized vs. de-energized cable, other utilities, street crossings
8. Remove existing overhead cable crossing per span	0.8 hours	This activity has been defined as cutting the cable down and rolling it up.	1.0 hours		1.4 hours	traffic, energized vs. de-energized cable, other utilities, street crossings

Cable Activities:	Lowest Duration in Your Experience	Factors that Contribute to Productivity	Average Duration in Your Experience	Factors that Contribute to Productivity	Highest Duration in Your Experience	Factors that Contribute to Productivity
1. Adjust one fiber optic aerial cable	1 hour	adjustment of one wooden pole, fiber optic cable	2 hours	wooden pole, fastening & re-fastening	3 hours	concrete pole, one hour to drill
1 Replace one fiber optic aerial cable	4 hours	defined this activity as install & remove, wood poles, deenergized cable	5 hours	wood poles same drilling time as previous case, energized cable	6 hours	concrete pole
2. Place and pull new coaxial cable through a four-inch duct.	We do not use coaxial cable.					
3. Splice and activate new coaxial cable.	We do not use coaxial cable.					
4. Directional bore 100 feet for 4-inch duct	1 day	dry, sand, no mud, locates are good	2 days	1 previous failed attempt	4 days	very rocky scenario, utilities unknown, wet conditions
5 Relocate three fiber overhead cables to new poles	6 hours	defined as one span, two poles--just moving time, splicing not included; 1 attachment per cable per pole; rest of the conditions are the same as #1	12 hours	conditions the same as #1	18 hours	conditions the same as #1
6. Remove one existing underground amplifier and power supply	We do not perform this activity.					
7. Remove existing overhead cable per 100 feet.	0.4 hours	This activity has been defined as cutting the cable down and rolling it up.	0.5 hours		0.7 hours	traffic, energized vs. de-energized cable, other utilities, street crossings
8. Remove existing overhead cable crossing per span	0.8 hours	This activity has been defined as cutting the cable down and rolling it up.	1.0 hours		1.4 hours	traffic, energized vs. de-energized cable, other utilities, street crossings

Phone Activities:	Lowest Duration in Your Experience	Average Duration in Your Experience	Highest Duration in Your Experience	Factors that Contribute to Productivity
	(Days)	(Days)	(Days)	
1. Install and splice 100 linear feet of buried copper cable.	2	3	5	special conduit cut-over, ground conditions
2. Install and splice 100 linear feet of buried fiber cable.	2	3	5	special conduit cut-over, ground conditions
3. Install and splice 100 linear feet of aerial copper cable.	2	3	5	special conduit cut-over, ground conditions
4. Install and splice 100 linear feet of aerial fiber cable.	2	3	5	special conduit cut-over, ground conditions
5. Install and splice 100 linear feet of copper cable in conduit.	2	3	5	special conduit cut-over, ground conditions, manhole access, traffic
6. Install and splice 100 linear feet of buried fiber cable in conduit.	2	3	5	special conduit cut-over, ground conditions, manhole access, traffic
7. Place fifty feet of X-pair cable out of service.	included in above splicing work			included in other splicing work
8. Place (1) 4" sched. 40 PVC conduit out of service.	included in placing work			included in other placing work
9. Place (1) 4" sched. 40 PVC conduit in service	1	--	--	rocks
10. Lower fifty linear feet of X-pr cable.	1	2	3	rocks, must expose 150' to lower 50'
11. Install and connect one handhole and duct system.	2	3	--	
12. Adjust one telephone handhole to final grade.	0.5	1	2	need road surveyor to shoot grade
13. Adjust frame and cover for one manhole.	0.5	1	2	need road surveyor to shoot grade
14. Splice one 900-pair cable.	2	3	5	special ckt. cutover, this is done with two people

Electric Activities (Underground):	Lowest Duration in Your Experience		Average Duration in Your Experience		Highest Duration in Your Experience	Factors that Contribute to Productivity
					(Days)	
1. Remove three buried cables per fifty feet	1.5 hours	Assume in conduit, up to 4/0	2 hours		6 hours	problems with conduit
1. Remove three buried cables per fifty feet	2.5 hours	Assume in conduit, larger than 4/0	3 hours		9 hours	problems with conduit
2. Place duct bank X by Y of Z-inch conduit for fifty feet	0.1 hr/ft to dig	The highest we go is 3 high and 2 wide. Assume 6" PVC conduit (big feeders).	1.2 hr/ft to dig		7.5 hr/ft to dig	rock, mud, or wet conditions
3. Remove 3-100 mm conduits for fifty feet	We do not perform this activity.					
4. Adjust existing electric conduits	1 day	We are assuming live wire conditions.	1.5 days		2 days	soil conditions, traffic, ability to switch cable
5. Place pre-cast manhole	2 days	9' X 12' X 8' manhole; precast company usually installs for them	3 days		5 days	location of manhole, number of surrounding utilities, soil conditions, re-routing of traffic, going into pavement or grass

Electric Activities (Overhead):	Lowest Duration in Your Experience		Average Duration in Your Experience		Highest Duration in Your Experience	Factors that Contribute to Productivity
1. Relocate per span one 13 kV line	0.5 days	Assume 3 phase 795 double AC, assume moving it 2' vertical to vertical. This scenario uses wooden pole with no transformers, no risers.	1 day	limited equipment, wooden pole, transformer and riser	2 days	In this case, we usually reconstruct the scenario. Assume concrete poles, move 2'.
2. Relocate one pole for 12.47 kV line	0.5 days	wood pole, no equipment on pole, energized	1.5 days	wood pole, equipment on pole, energized	3 days	concrete poles, equipment, traffic, dig by hand
3. Remove one overhead electric crossing for a 13.2 kV line.	16 man-hours	This information does not include poles, just removing the span of wire. Lowest case includes double-dead ended cable, 2 lane road.	16 man-hours		40 man-hours	4 troopers in rolling blockade, center supports, 2 crews, crossing an interstate, requires 3 bucket trucks
4. Remove fifty feet of aerial cable	0.5 hours	Assuming 3 phase 795 cable. No traffic, lots of right of way, cable is already dead-ended.	0.5 hours		1 hour	lots of traffic, not enough right of way
5. Provide service for street light load center (480 V)	0.5 days	single phase	0.75 days		1.5 days	3 phase; really are not any other factors--DOT provides transformer
6. Remove poles for an aerial crossing	0.5 days	Assuming the removal of 2 poles. Wooden pole	1 day	wooden pole, traffic, filling the hole, dirt on site.	1.5 days	concrete pole, crane, semi to haul pole away
7. Provide service for traffic signal (120 V)	As the result of a new policy, signals must go to our point of service.					

Electric Activities (Overhead): (1)	Lowest duration in your experience (2)	Factors that contribute to low duration	Average duration in your experience (2)	Factors that contribute to average duration	Highest duration in your experience (2)	Factors that contribute to high duration
	(Days)		(Days)		(Days)	
1. Relocate per span one 12.47 kV line	One day	Crew availability, truck access, clean poles (no pole mounted equipment), no outage or MOT coordination required	Three days	Crew availability, truck access, some pole mounted equipment, outage coordination required	Ten days	Crew availability, no truck access, extensive equipment, difficult outage coordination
2. Relocate one pole for 12.47 kV line	One day	Crew availability, truck access, clean poles (no pole mounted equipment), no outage or MOT coordination required	Two days	Crew availability, truck access, some pole mounted equipment, outage coordination required	Five days	Crew availability, no truck access, extensive pole mounted equipment, difficult outage and MOT coordination
3. Remove one overhead electric crossing for a 12.47 kV line	One day	Crew availability, truck access,clean poles, no outage or MOT coordination required	Two days	Crew availability, truck access, pole mounted equipment, some outage and MOT coordination req.	Three days	Crew availability, no truck access, extensive equipment, difficult outage and MOT coordination
4. Remove fifty feet of aerial cable (120 V)	One day	Crew availability, truck access, no outage or MOT coordination required	One day	Crew availability, truck access, some outage or MOT coordination	Two days	No truck access, difficult outage or MOT coordination
5. Provide service for street light load center (480 V)	One day	Crew availability, truck access, no line work required (service drop and meter only), no MOT required	Three days	Crew availability, truck access, minor line work required, some MOT coordination	Ten days	Crew availability, no truck access, extensive line work required, difficult MOT coordination
6. Remove poles for an aerial crossing (poles 60' or less, direct embedded)	One day	Crew availability, truck access, no MOT coordination required	Two days	Crew availability, truck access, limited MOT coordination required	Four days	Crew availability, no truck access, difficult MOT coordination required
7. Provide service for traffic signal (120 V)	One day	Crew availability, truck access, no line work required (service drop and meter only), no MOT required	Three days	Crew availability, truck access, minor line work required, some MOT coordination	Ten days	Crew availability, no truck access, extensive line work required, difficult MOT coordination

Electric Activities (Underground): (1)	Lowest duration in your experience (2)	Factors that contribute to low duration	Average duration in your experience (2)	Factors that contribute to average duration	Highest duration in your experience (2)	Factors that contribute to high duration
	(Days)		(Days)		(Days)	
1. Remove three buried cables per fifty feet	One day	Crew availability, good site conditions, low ground water, good soil, no outage or MOT coordination required	Two days	Crew availability, average site conditions, some ground water, average soil, some outage or MOT coordination required	Five days	Crew availability, poor site conditions, high ground water, unsuitable soils, extensive outage or MOT coordination required
2. Place duct bank X by Y of Z-inch conduit for fifty feet	One day	Crew availability, good site conditions, low ground water, good soil, no outage or MOT coordination required	Two days	Crew availability, average site conditions, some ground water, average soil, some outage or MOT coordination required	Five days	Crew availability, poor site conditions, high ground water, unsuitable soils, extensive outage or MOT coordination required
3. Remove 3-100 mm conduits for fifty feet	One day	Crew availability, good site conditions, low ground water, good soil, no outage or MOT coordination required	Two days	Crew availability, average site conditions, some ground water, average soil, some outage or MOT coordination required	Five days	Crew availability, poor site conditions, high ground water, unsuitable soils, extensive outage or MOT coordination required
4. Adjust existing electric conduits (minor adjustment, per location)	One day	Crew availability, good site conditions, low ground water, good soil, no outage or MOT coordination required	Two days	Crew availability, average site conditions, some ground water, average soil, some outage or MOT coordination required	Five days	Crew availability, poor site conditions, high ground water, unsuitable soils, extensive outage or MOT coordination required
5. Place pre-cast manhole	Two days	Crew availability, good site conditions, low ground water, good soil, no outage or MOT coordination required	Five days	Crew availability, average site conditions, some ground water, average soil, some outage or MOT coordination required	Ten days	Crew availability, poor site conditions, high ground water, unsuitable soils, extensive outage or MOT coordination required

(1) Activities listed represent only a small portion of the relocation activities that are performed by this utility.

(2) Duration is actual on site days and does not include weather delays or time off the job due to other emergency power restoration requirements. Duration may or may not be consective calendar days.

Electric Activities (Underground):	Lowest Duration in Your Experience	Average Duration in Your Experience	Highest Duration in Your Experience	Factors that Contribute to Productivity
	(Days)	(Days)	(Days)	
1. Remove three buried cables per fifty feet	1.5	2	3	
2. Place duct bank X by Y of Z-inch conduit for fifty feet	1	1.25	2	
3. Remove 3-100 mm conduits for fifty feet	1.25	1.75	3	
4. Adjust existing electric conduits	1	1.25	2	
5. Place pre-cast manhole.	1.5	2	3	

Electric Activities (Overhead):	Lowest Duration in Your Experience	Average Duration in Your Experience	Highest Duration in Your Experience	Factors that Contribute to Productivity
	(Days)	(Days)	(Days)	
1. Relocate per span one 13 kV line	1	1.25	2	
2. Relocate one pole for 12.47 kV line.	1.5	2	3	
3. Remove one overhead electric crossing for a 13.2 kV line.	2	2.5	4	
4. Remove fifty feet of aerial cable	0.5	0.75	1	
5. Provide service for street light load center (480 V).	1	1.5	2	
6. Remove poles for an aerial crossing	2	3	4	
7. Provide service for traffic signal (120 V).	1	1.25	2	

November 22, 2000

Dr. Ralph Ellis
University of Florida

Re: Utility Production Rate Scheduling

Dr. Ellis,

I am responding to University of Florida's request to members of the Florida Utilities Coordinating Committee (FUCC) for utility construction duration data. Since I represent --- Company, I'll address only the electric portion of the request.

I appreciate that your group is taking the time to solicit input from the utility industry. I'm quite concerned however, that the survey's format will cause the collection of inconsistent data and subsequent derivation of inaccurate conclusions.

The survey solicits duration times, but offers no definition as to what "duration" *specifically* means. Does duration mean actual *construction time* (crew site time), or *total project time*, which would include the time required for *all* support activities (design, permitting, material procurement, scheduling, surveying, travel, etc.) and external forces (weather, contractor labor availability, right of way acquisition/clearing, CaTV and Tel. Co. attachments to poles, etc.) that might affect a project's duration?

The answer given at the presentation was construction time. If so, our duration "days" for each of the listed activities could be "one," since each of the listed activities typically, under certain circumstances, could be performed in a matter of hours. Certain activities, such as the tapping of a customer owned traffic signal or street light service to an existing 120v electrical source, might even require just minutes!

Construction time seems contrary to the project's purpose, however. If the purpose is to develop "per unit" duration times to facilitate FDOT validation of utility estimated relocation times, I'm inclined to think the survey might rather be asking for *everything* that typically affects project time.

The possibility that *everything* be included concerns me for two reasons. First, utility folks may not answer the survey from the same perspective. Individual responses may indicate either *construction time* or *total project time*, with no distinction between the two. My greater concern however, is that *all* time incorporated into a single unit (for purposes of multiplying per unit duration by total number of units to determine total project duration) will lead to questionable results when used to estimate that total duration. To illustrate this point, the total time required to design, permit, schedule, travel to and relocate a single pole might be 6 weeks. This does not necessarily mean however, that twice the per unit time (or 12 weeks) is required to relocate 2 poles, or that 18 weeks is required to relocate 3...

Finally, I'm concerned that the survey's list of overhead electric activities does not nearly represent the complex nature of electrical utility relocation work. For example:

- relocating a 13kV single phase span requires far less time than a three phase span,
- transmission (>69kV) poles and spans, which are not listed, require much more time to design, permit, procure material, schedule, and relocate, than distribution (<69kV);

- removing poles (aerial crossing) with nothing attached might take hours, whereas complicated poles (attached to transmission conductors; distribution primary, secondary, and service conductors; distribution primary, secondary, service and customer owned cable risers; transformers, guy wires, switches, and street lights; CaTV and Tel Co. attachments; et al) might take days;
- service to a 120v traffic signal or street light circuit might require only minutes when connecting a customer owned service riser to existing electrical secondary source, but days for a new pole, switch, transformer, and the overhead or UG service conductors).

Accurately estimating the duration of utility projects is most difficult, particularly when the work is estimated far in advance and subject to so many variables. Yours is a difficult task - I hope you find my comments to be helpful. Please feel free to contact me at --- if you would like to discuss this issue further.

Thanks to you again for requesting our input.

Sincerely,

Relocation Coordinator

APPENDIX FIVE: CALIBRATED DURATIONS FOR ACTIVITY LIST

Utility Categories and Activities:

Cable Activities:	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Adjust or replace one fiber optic aerial cable.	1	10
2. Place and pull new coaxial cable through a four-inch duct.	5	10
3. Splice and activate new coaxial cable.	5	10
4. Directional bore 100 feet for 4-inch duct.	1	1
5. Relocate three fiber overhead cables to new poles.	0.05	0.05
6. Remove one existing underground amplifier and power supply.	1	1
7. Remove existing overhead cable per 100-feet.	0.5	10
8. Remove existing cable crossing per span.	1	1

Gas Activities:	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Protect and support ten linear feet of one low pressure gas line.	2	3
2. Adjust one 2-inch steel pipe.	3	5
3. Lower one ¾" service line in place.	2	2
4. Install one new 2-inch gas line per 50 linear feet.	0.6	5
5. Install one bottom-out connection for one 4-inch gas main.	1	2
6. Place out of service one 4-inch gas line per fifty linear feet.	1	4.5
7. Lower one high-pressure gas line.	*	*
8. Encase one high-pressure gas line.	*	*

Electric Activities (Overhead):	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Relocate per span one 13 kV line.	0.2	5.2
2. Relocate one pole for 12.47 kV line.	0.1	1
3. Remove one overhead electric crossing for a 13.2 kV line.	2	4.5
4. Remove fifty feet of aerial cable.	0.1	1
5. Provide service for street light load center (480 V).	*	*
6. Remove poles for an aerial crossing.	1	4
7. Provide service for traffic signal (120 V).	1	4

Electric Activities (Underground):	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Remove three buried cables per fifty feet.	0.3	0.7
2. Place duct bank X by Y of Z-inch conduit for fifty feet.	0.15	10
3. Remove 3-100 mm conduits for fifty feet.	0.2	1.6
4. Adjust existing electric conduits.	1	1
5. Place pre-cast manhole.	2	2

Phone Activities:	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Install and splice 100 linear feet of buried copper cable.	**	**
2. Install and splice 100 linear feet of buried fiber cable.	**	**
3. Install and splice 100 linear feet of aerial copper cable.	*	*
4. Install and splice 100 linear feet of aerial fiber cable.	*	*
5. Install and splice 100 linear feet of copper cable in conduit.	*	*
6. Install and splice 100 linear feet of buried fiber cable in conduit.	*	*
7. Place fifty feet of X-pair cable out of service.	0.1	3.8
8. Place (1) 4" sched. 40 PVC conduit out of service.	0.8	1.2
9. Place (1) 4" sched. 40 PVC conduit in service.	0.8	1.2
10. Lower fifty linear feet of X-pr cable.	1.0	8.0
11. Install and connect one handhole and duct system.	*	*
12. Adjust one telephone handhole to final grade.	1	1
13. Adjust frame and cover for one manhole.	2	2
14. Splice one 900-pair cable.	*	*

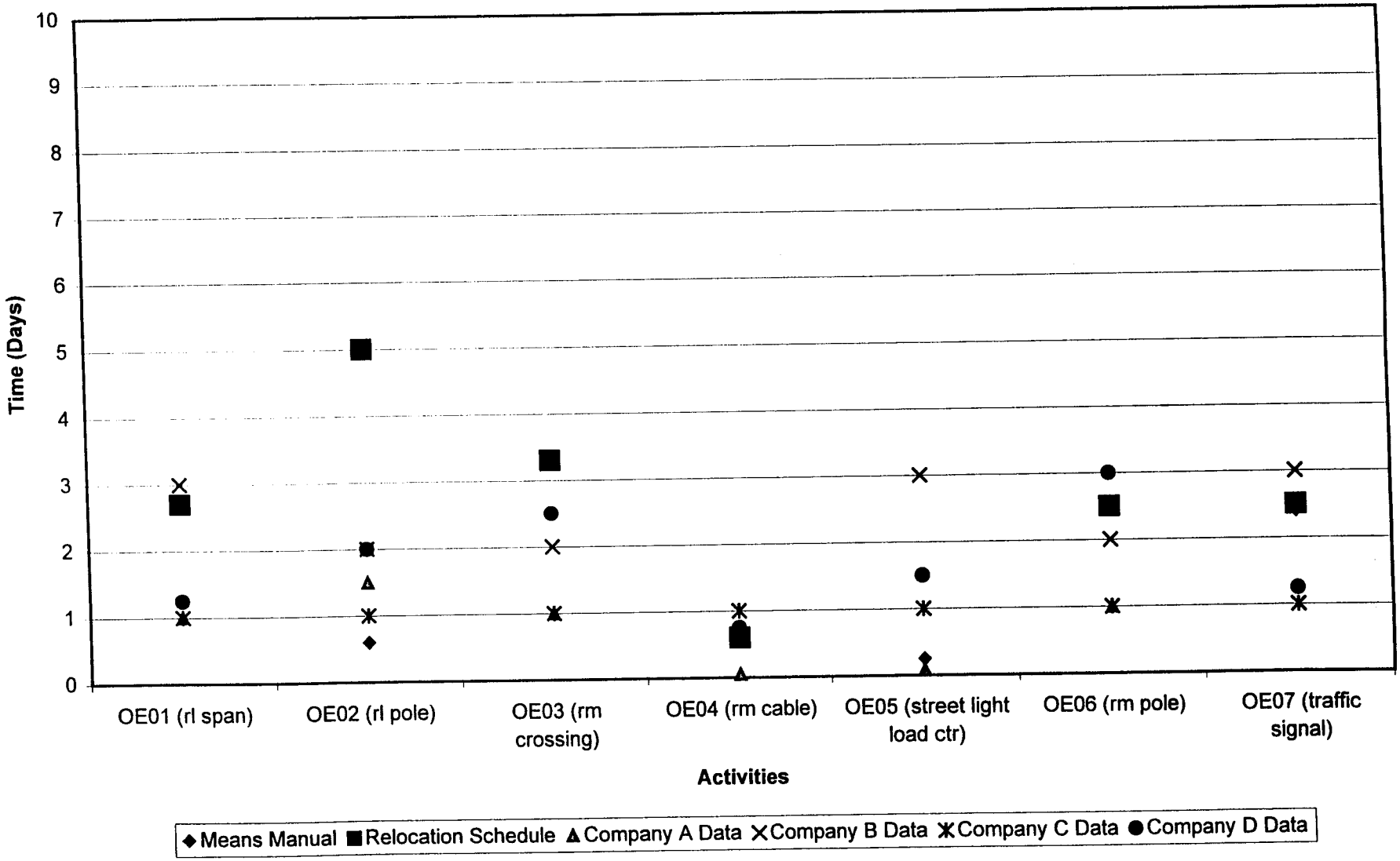
Sewer Activities:	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Furnish, install, and connect fifty linear feet of X-inch PVC SDR.	0.9	2.7
2. Furnish, install, and connect fifty linear feet of X-inch PVC FM.	0.4	1.1
3. Remove and replace fifty linear feet of X-inch PVC FM.	2.7	9.1
4. Plug and place out of service one 8-inch sanitary sewer main.	30	30
5. Re-route fifty linear feet of X-inch PVC FM.	1	2
6. Grout fill one X-inch sanitary sewer lateral for fifty linear feet.	2.6	4.5
7. Furnish and install one manhole.	1	1
8. Adjust ring and cover to grade for one manhole.	0.5	5

Water Activities:	Lowest Duration on Relocation Schedule (Days)	Highest Duration on Relocation Schedule (Days)
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.	0.25	3
2. Cut and plug one X-inch pipe.	0.5	0.5
3. Adjust one water valve box to grade.	0.25	0.25
4. Adjust one X-inch WM.	0.25	0.25
5. Remove and replace fifty linear feet of X-inch WM.	0.2	2.9
6. Furnish and install one fire hydrant assembly.	0.35	0.35
7. Remove and replace one fire hydrant assembly.	0.5	5.0
8. Remove and replace one water meter.	0.25	1.0
9. Relocate one water meter.	0.15	2.0

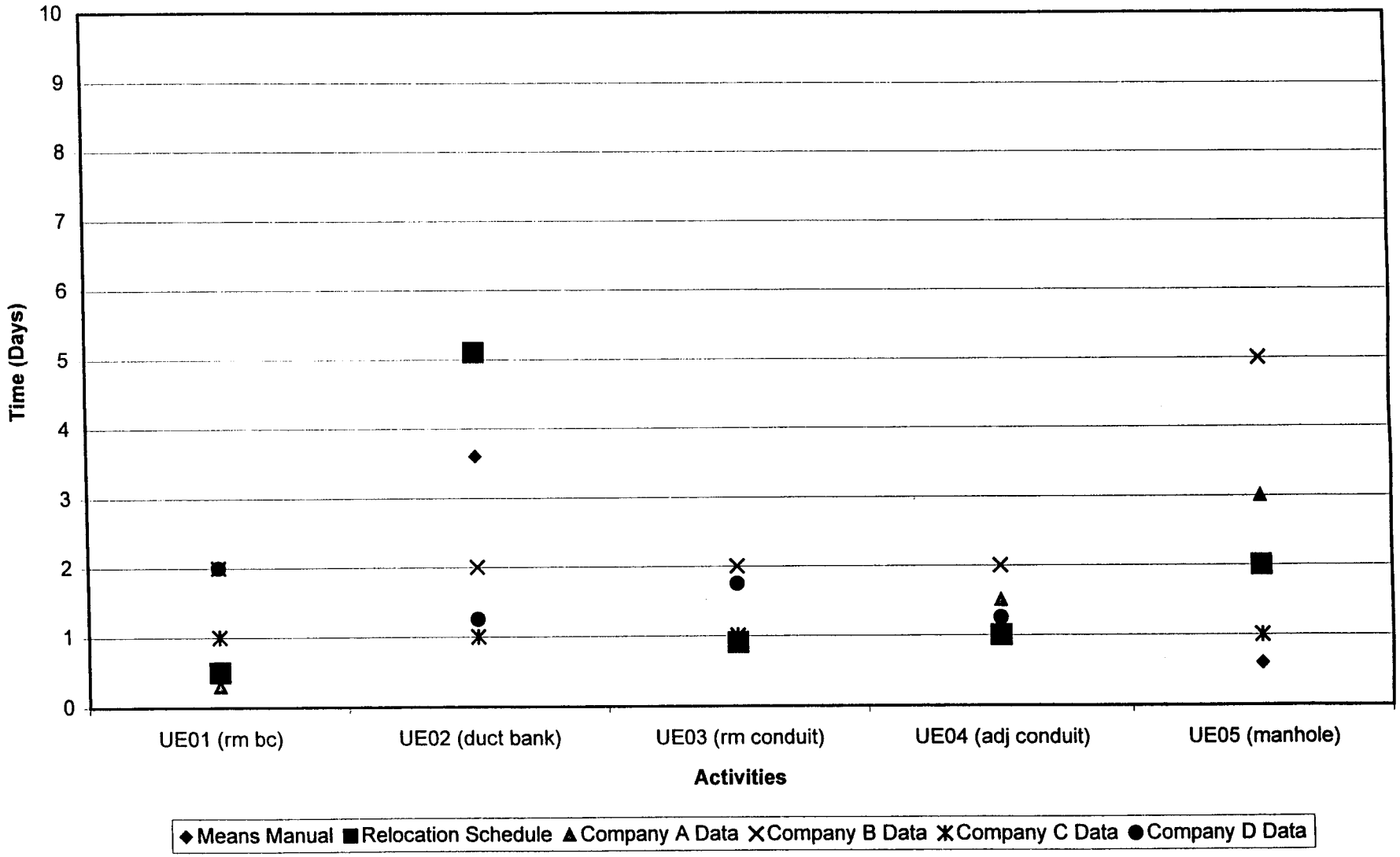
- An asterisk denotes that there is no data for this activity in the database created from the utility relocation schedules. This activity has been included in this list by the request of a district utility engineer.
- A double asterisk denotes that the utility relocation schedules did not state whether or not the cable being spliced was copper or fiber. Fiber cables tend to have a higher splicing time; therefore, the material from which the cable is made should be mentioned in the schedules.

APPENDIX SIX: GRAPHICAL COMPARISONS OF DATA RECEIVED

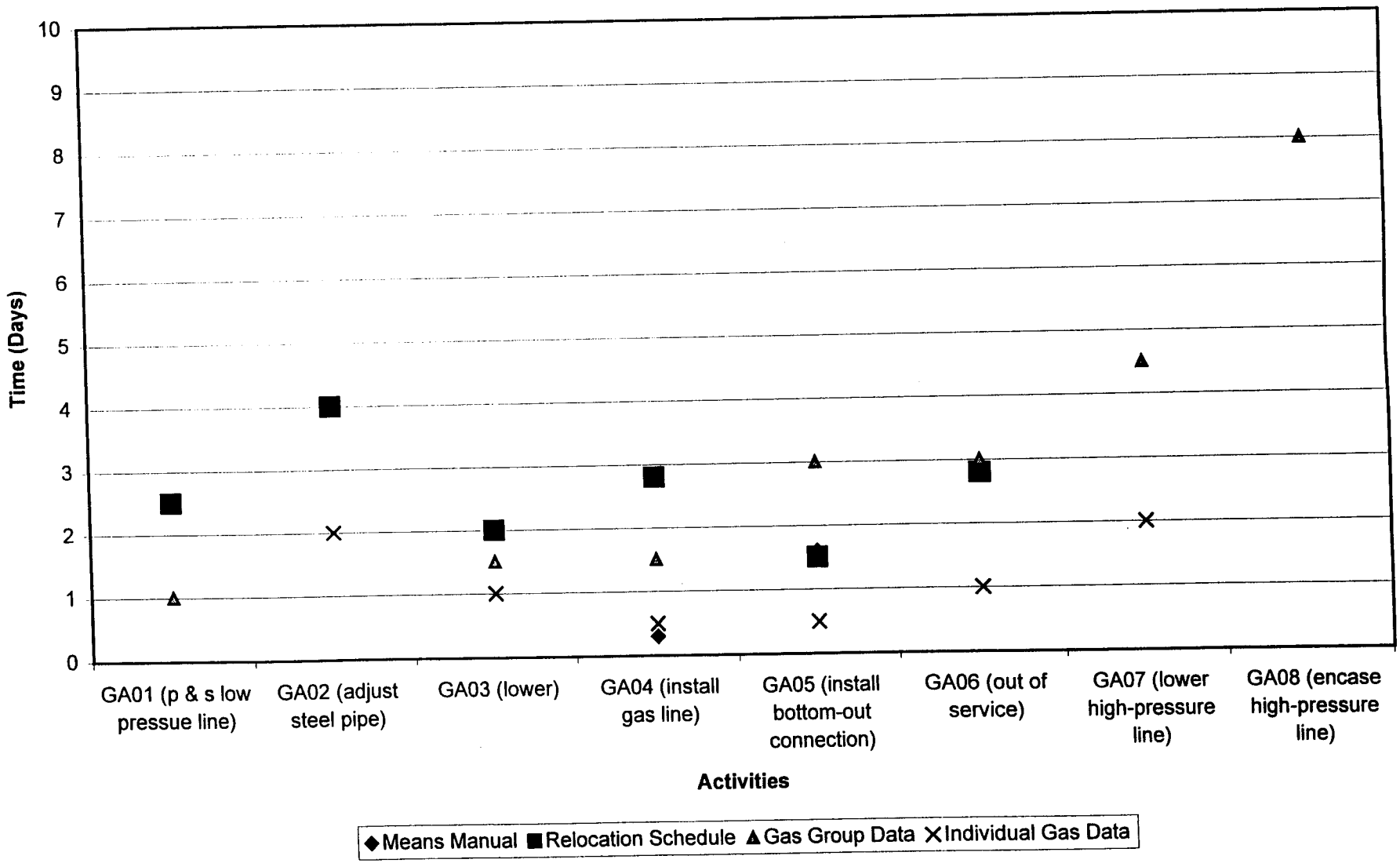
Comparison of Average Values for Overhead Electric Relocations



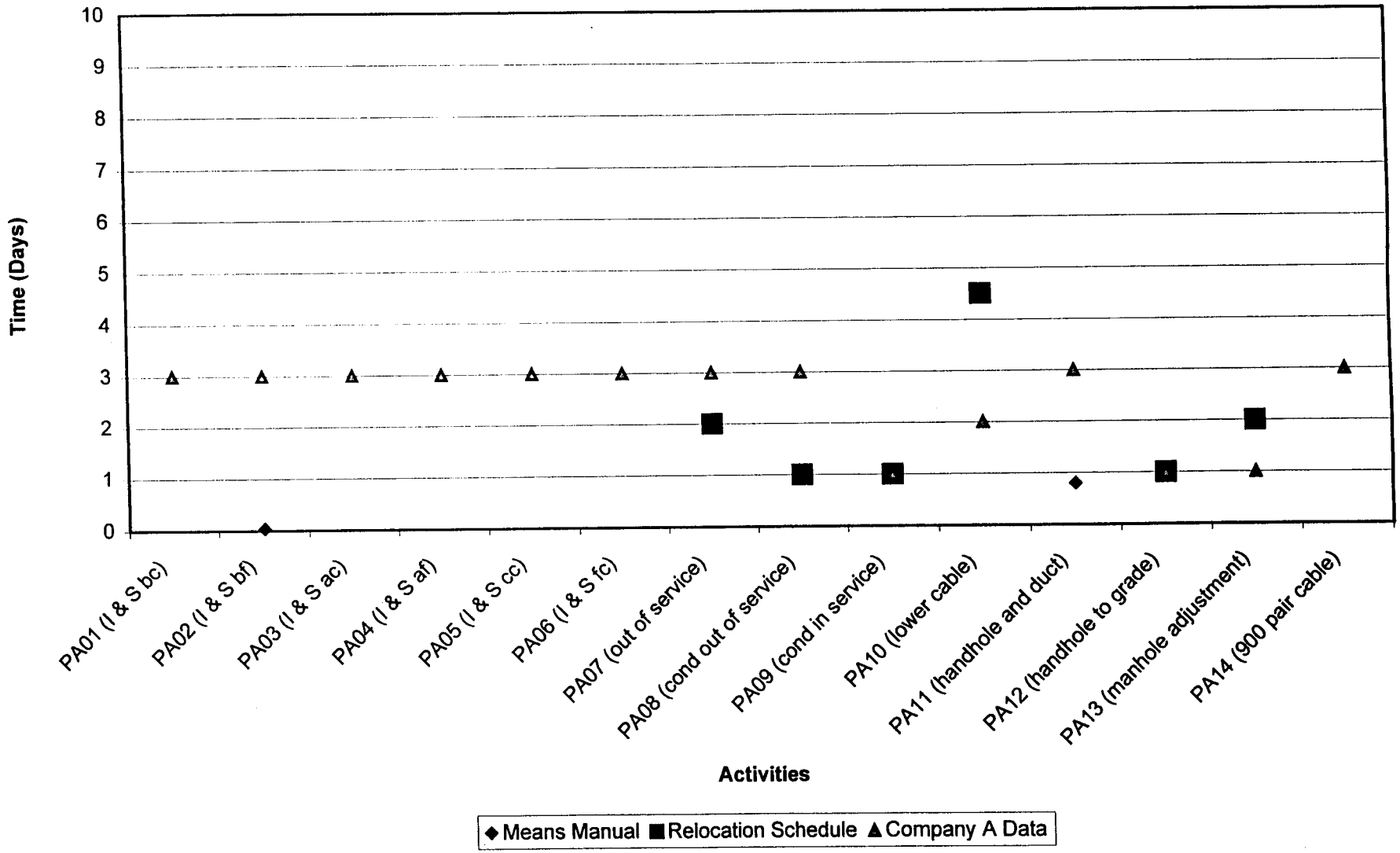
Comparison of Average Values for Underground Electric Relocations



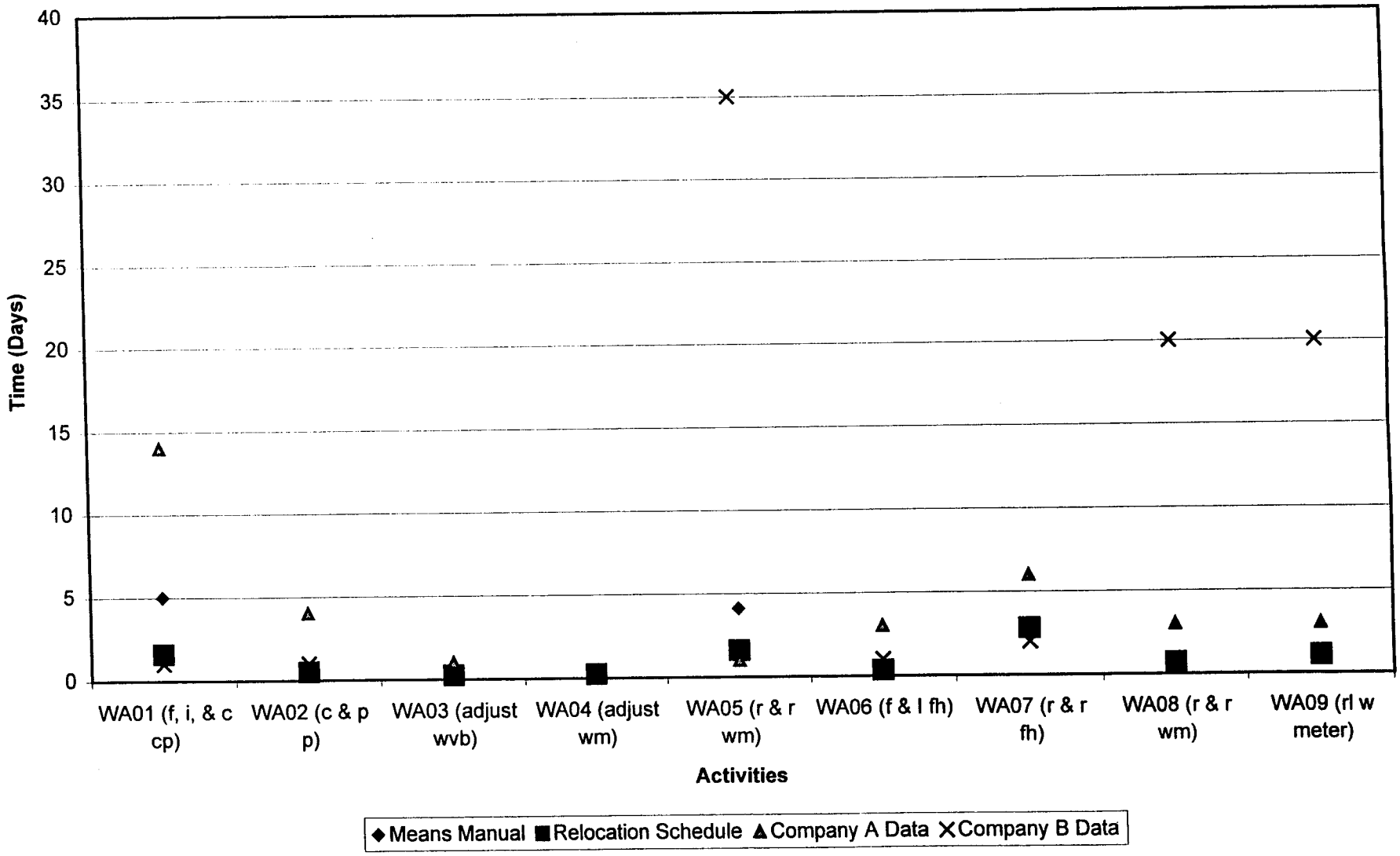
Comparison of Average Values for Gas Relocations



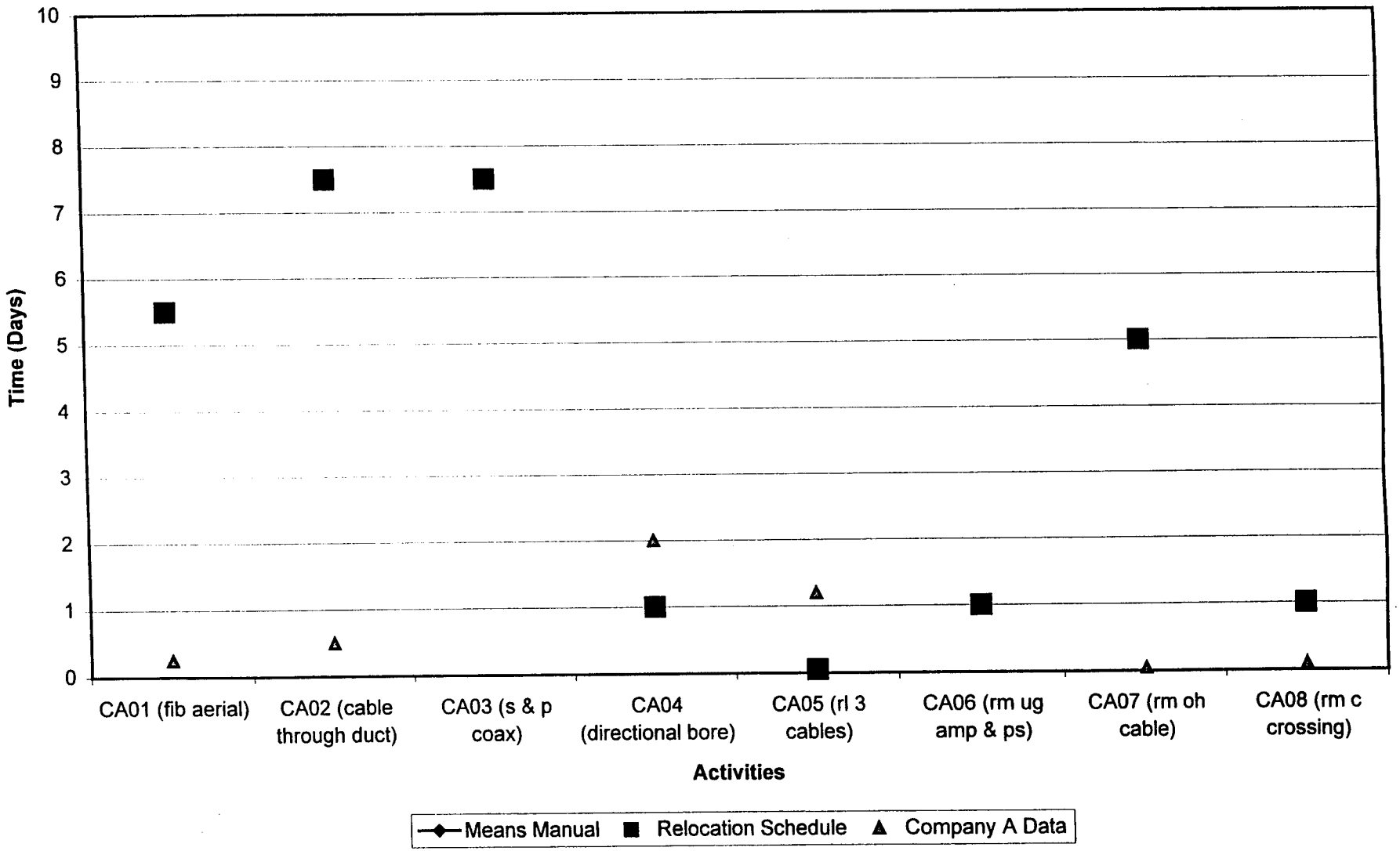
Comparison of Average Values for Phone Relocations



Comparison of Average Values for Water Relocations



Comparison of Average Values for Cable Relocations



Cable Activities:	Duration from Means Manual (Days)
1. Adjust or replace one fiber optic aerial cable.	*
2. Place and pull new coaxial cable through a four-inch duct.	*
3. Splice and activate new coaxial cable.	*
4. Directional bore 100 feet for 4-inch duct.	*
5. Relocate three fiber overhead cables to new poles.	*
6. Remove one existing underground amplifier and power supply.	*
7. Remove existing overhead cable per 100-feet.	*
8. Remove existing cable crossing per span.	*

Gas Activities:	Duration from Means Manual (Days)
1. Protect and support ten linear feet of one low pressure gas line.	*
2. Adjust one 2-inch steel pipe.	*
3. Lower one ¾" service line in place.	*
4. Install one new 2-inch gas line per 50 linear feet.	0.33
5. Install one bottom-out connection for one 4-inch gas main.	1.6
6. Place out of service one 4-inch gas line per fifty linear feet.	*
7. Lower one high-pressure gas line.	*
8. Encase one high-pressure gas line.	*

Electric Activities (Overhead):	Duration from Means Manual (Days)
1. Relocate per span one 13 kV line.	*
2. Relocate one pole for 12.47 kV line.	0.6
3. Remove one overhead electric crossing for a 13.2 kV line.	*
4. Remove fifty feet of aerial cable.	*
5. Provide service for street light load center (480 V).	0.25
6. Remove poles for an aerial crossing.	*
7. Provide service for traffic signal (120 V).	2.4

Electric Activities (Underground):	Duration from Means Manual (Days)
1. Remove three buried cables per fifty feet.	*
2. Place duct bank X by Y of Z-inch conduit for fifty feet.	3.6
3. Remove 3-100 mm conduits for fifty feet.	*
4. Adjust existing electric conduits.	*
5. Place pre-cast manhole.	0.6

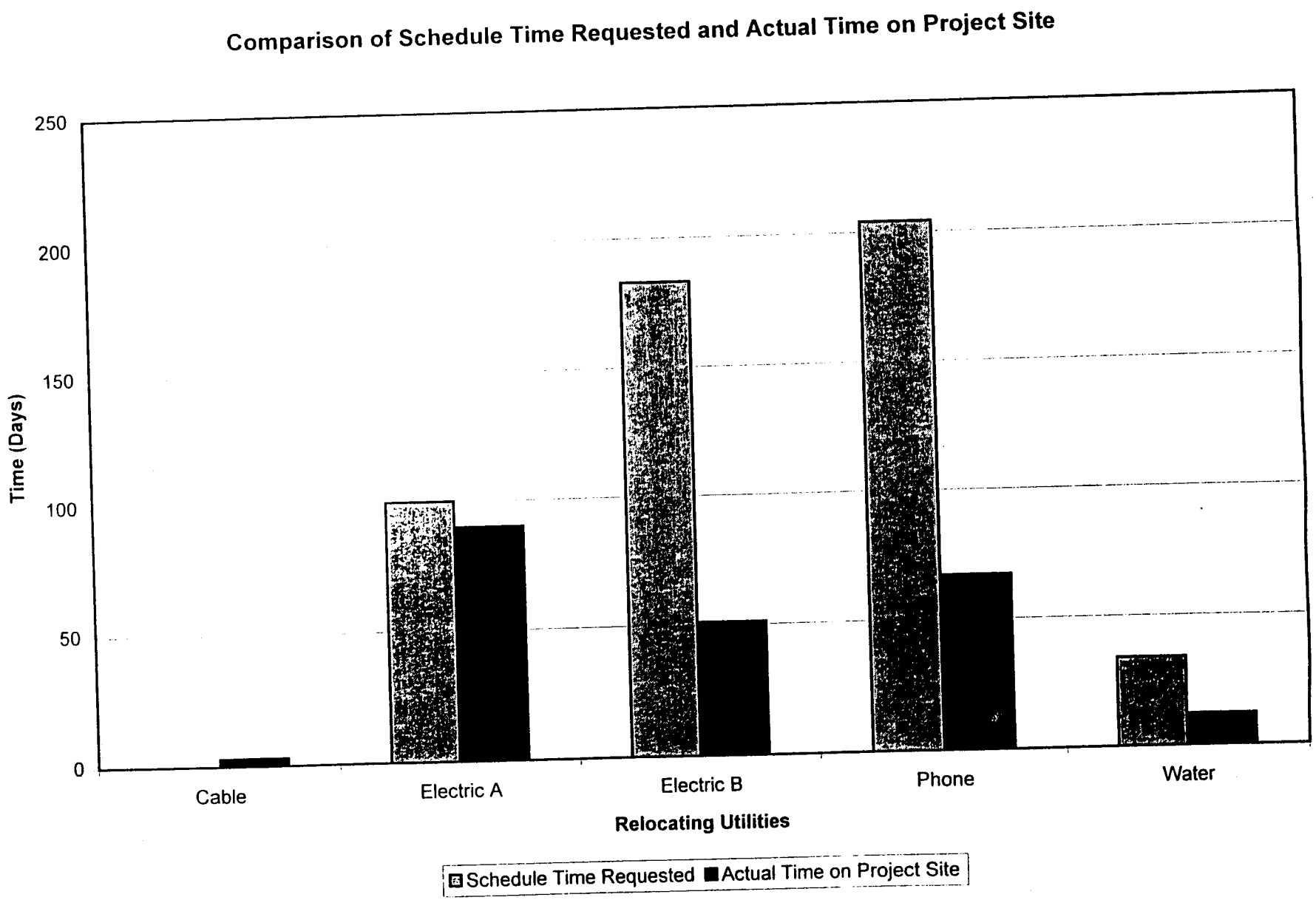
Phone Activities:	Lowest Duration on Relocation Schedule (Days)
1. Install and splice 100 linear feet of buried copper cable.	*
2. Install and splice 100 linear feet of buried fiber cable.	0.04
3. Install and splice 100 linear feet of aerial copper cable.	*
4. Install and splice 100 linear feet of aerial fiber cable.	*
5. Install and splice 100 linear feet of copper cable in conduit.	*
6. Install and splice 100 linear feet of buried fiber cable in conduit.	*
7. Place fifty feet of X-pair cable out of service.	*
8. Place (1) 4" sched. 40 PVC conduit out of service.	*
9. Place (1) 4" sched. 40 PVC conduit in service.	*
10. Lower fifty linear feet of X-pr cable.	*
11. Install and connect one handhole and duct system.	0.8
12. Adjust one telephone handhole to final grade.	*
13. Adjust frame and cover for one manhole.	*
14. Splice one 900-pair cable.	*

Sewer Activities:	Lowest Duration on Relocation Schedule (Days)
1. Furnish, install, and connect fifty linear feet of X-inch PVC SDR.	1
2. Furnish, install, and connect fifty linear feet of X-inch PVC FM.	1
3. Remove and replace fifty linear feet of X-inch PVC FM.	*
4. Plug and place out of service one 8-inch sanitary sewer main.	*
5. Re-route fifty linear feet of X-inch PVC FM.	*
6. Grout fill one X-inch sanitary sewer lateral for fifty linear feet.	*
7. Furnish and install one manhole.	2.7
8. Adjust ring and cover to grade for one manhole.	*

Water Activities:	Duration from Means Manual (Days)
1. Furnish, install, and connect fifty linear feet of Type K copper pipe.	5
2. Cut and plug one X-inch pipe.	*
3. Adjust one water valve box to grade.	*
4. Adjust one X-inch WM.	*
5. Remove and replace fifty linear feet of X-inch WM.	4.1
6. Furnish and install one fire hydrant assembly.	0.6
7. Remove and replace one fire hydrant assembly.	*
8. Remove and replace one water meter.	*
9. Relocate one water meter.	*

An asterisk denotes that information for that activity or an equivalent activity was not found.

APPENDIX SEVEN: RELOCATION SCHEDULES AND DAILY REPORTS OF PROGRESS


Comparison of Schedule Time Requested and Actual Time on Project Site
250
200
150
100
50
0
Time (Days)
Cable
Electric A
Electric B
Phone
Water
Relocating Utilities
Schedule Time Requested
Actual Time on Project Site

COMCAST CABLE

Day No.	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
1	Stringing cable (stran wire) in preparation for trunk cable (T.V.) from new 65' conc pole (FPL). O/S lt cl const. SR 53 @ Sta 10+43 running SE crossing O/E SR 53 to new pole (FPL). O/S rt cl const. SR 53 @ Sta 11+18 and continuing east to Sta 19+11.	5/14/99	7.5	1	1	1				2 bucket trucks, 1 utility van, 1 reel trailer, hand tools		no effect all day	5	acceptable all day	dry
2	Contractor placing new TV cable, Sta 11+00 to 14+00	5/24/99	8		1	1				1 bucket trucks, 2 pickup trucks, 1 four wheeler		no effect all day	5	acceptable all day	dry
3	Contractor placing cable (TV cable) onto new power poles, Sta 9+00 to Sta 11+00	5/25/99	8		1	1				2 bucket trucks		no effect all day	5	acceptable all day	dry

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time	Dependent Activities	Activity/Offset	Utility Agent/
35040-6503	21053415201	electric	Overhead three-phase 7 2/12 5 KV electric lines Sta 66+00 to Sta 160+40 Offset varies left and right of center line	Overhead crossings at stations 66+06r, 67+35r, 68+23r, 68+83r, 69+41r, 71+30r, 73+50l&r, 75+00r, 76+23l, 77+62l, 80+84l, 80+84l, 83+67.5l, 84+56l,85+33.5l, 90+07l, 90+17l, 93+43l,94+27l, 94+55l, 95+75l, 96+97l, 98+78l, 99+10l, 104+85r, 105+24r, 106+85l, 109+64l, 111+11l, 112+22l, 119+64l, 121+00l, 121+64l, 126+85.5l, 126+94l, 127+98l, 128+44l, 133+85r, 134+07r, 135+13r, 136+19r, 139+12r, 141+39l, 144+15l, 147+89l, 154+26l, 160+40l	30	prior to construction	Power poles to be replaced at stations: 65+96l, 66+15r, 67+35l, 67+36.5r, 76+23r, 87+33r, 96+97.5l, 98+67r, 98+94l, 99+40l, 111+11l, 119+75l, 120+96r, 126+89l, 138+91l	ELECTRIC B
35040-6503	21053415201	electric	Overhead three-phase 7 2/12 5 KV electric lines Sta 66+00 to Sta 160+40 Offset varies left and right of center line	Overhead crossings at stations: 66+06r, 67+35r, 68+23r, 68+83r, 69+41r, 71+30r, 73+50l&r, 75+00r, 76+23l, 77+62l, 80+84l, 80+84l, 83+67.5l, 84+56l,85+33.5l, 90+07l, 90+17l, 93+43l,94+27l, 94+55l, 95+75l, 96+97l, 98+78l, 99+10l, 104+85r, 105+24r, 106+85l, 109+64l, 111+11l, 112+22l, 119+64l, 121+00l, 121+64l, 126+85.5l, 126+94l, 127+98l, 128+44l, 133+85r, 134+07r, 135+13r, 136+19r, 139+12r, 141+39l, 144+15l, 147+89l, 154+26l, 160+40l	15	during construction	Power poles to be replaced at stations: 65+96l, 66+15r, 67+35l, 67+36.5r, 76+23r, 87+33r, 96+97.5l, 98+67r, 98+94l, 99+40l, 111+11l, 119+75l, 120+96r, 126+89l, 138+91l	ELECTRIC B
35040-6503	21053415201		Overhead three-phase 7 2/12 5 KV electric lines Sta 66+00 to Sta 160+40 Offset varies left and right of center line	Overhead crossings at stations: 66+06r, 67+35r, 68+23r, 68+83r, 69+41r, 71+30r, 73+50l&r, 75+00r, 76+23l, 77+62l, 80+84l, 80+84l, 83+67.5l, 84+56l,85+33.5l, 90+07l, 90+17l, 93+43l,94+27l, 94+55l, 95+75l, 96+97l, 98+78l, 99+10l, 104+85r, 105+24r, 106+85l, 109+64l, 111+11l, 112+22l, 119+64l, 121+00l, 121+64l, 126+85.5l, 126+94l, 127+98l, 128+44l, 133+85r, 134+07r, 135+13r, 136+19r, 139+12r, 141+39l, 144+15l, 147+89l, 154+26l, 160+40l	60	prior to construction	Power poles to be replaced at stations: 68+24l, 68+8	ELECTRIC B
35040-6503	21053415201		Overhead three-phase 7 2/12 5 KV electric lines. Sta. 66+00 to Sta 160+40. Offset varies left and right of center line	Overhead crossings at stations: 66+06r, 67+35r, 68+23r, 68+83r, 69+41r, 71+30r, 73+50l&r, 75+00r, 76+23l, 77+62l, 80+84l, 80+84l, 83+67.5l, 84+56l,85+33.5l, 90+07l, 90+17l, 93+43l,94+27l, 94+55l, 95+75l, 96+97l, 98+78l, 99+10l, 104+85r, 105+24r, 106+85l, 109+64l, 111+11l, 112+22l, 119+64l, 121+00l, 121+64l, 126+85.5l, 126+94l, 127+98l, 128+44l, 133+85r, 134+07r, 135+13r, 136+19r, 139+12r, 141+39l, 144+15l, 147+89l, 154+26l, 160+40l	30	during construction	Power poles to be replaced at stations: 68+24l, 68+8	ELECTRIC B
35040-6503	21053415201	overhead el	overhead single-phase 7.2 KV electric distribution line Sta. 160+40 through 199+38 as shown on FDOT plans. Offset varies from 10 m to 14 m right of centerline. Overhead crossings at stations: 165+76L, 169+45l, 170+17.5l, 170+18.5l, 171+74l, 173+22l, 178+77l, 179+37l, 183+40l, 184+53l, 185+99l, 194+24l, 199+28l, 199+21l, 199+38.85l	160+40r, 161+03r, 161+58r, 162+86r, 163+57r	8	prior to construction	power poles to be replaced in place at stations: 160+40r, 161+03r, 161+58r, 162+86r, 163+57r	ELECTRIC B

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time	Dependent Activities	Activity/Offset	Utility Agent/
35040-6503	21053415201	overhead el	overhead single-phase 7.2 KV electric distribution line Sta 160+40 through 199+38 as shown on FDOT plans Offset varies from 10 m to 14 m right of centerline Overhead crossings at stations 165+76L, 169+45l, 170+17.5l, 170+18.5l, 171+74l, 173+22l, 178+77l, 179+37l, 183+40l, 184+53l 185+99l, 194+24l, 199+28l, 199+21l, 199+38.85l	Sta 165+7l through Sta 199+16.5	40	prior to construction	Pole line to be relocated 12 m to 14 m right and left of centerline from Sta 165+7l through Sta 199+16.5	ELECTRIC B
35040-6503	21053415201	electric	69 KV transmission line	Sta 64+07	10	prior to construction	Relocate structure from Lt. 00+15 to Lt 00+30	ELECTRIC A
35040-6503	21053415201	electric	Existing overhead three phase, 12,470 volt wood pole structures	from Sta 00 to Sta 58+28 as shown on plan sheets except crossing left to right at Sta 28+56	90 for all activities in this category	none	To remain in place: Sta 00 - Sta 3+42 (rt), Sta 6+53 (rt) - Sta 10+12 (rt), Sta 12+78 - (lt), Sta 18+03 (lt), Sta 18+27 (lt) Sta 20+95 - Sta 25+84 (rt), Sta 21+06 - sta 26+43 (lt), Sta 33+34 (rt), Sta 35+87 (rt), Sta 45+08 (rt), Sta 46+68 (rt), Sta 48+16 (rt), Sta 48+80 (rt), Sta 49+66 (rt), Sta 51+18 - Sta 57+80 (rt) and Sta 58+28 - Sta 61+63 (rt). Sta 34+60 (rt) and Sta 49+50 (lt).	ELECTRIC A
35040-6503	21053415201	electric	single phase, 7200 volt, overhead	from Sta 58+28 to 64+75	90 for all activities in this category	pending CATV and/or telephone vacates	To be removed: Sta 3+43 rt, Sta 4+06 RT, Sta 4+13 lt, Sta 4+51 rt, Sta 5+13 rt, 5+82 rt, 5+85 lt, 9+14 lt, 10+37 rt, 10+37 lt, 11+17 rt, 11+17 lt, 11+94 rt, 12+90 rt, 14+22 rt, 15+52 rt, 16+53 rt, 16+56 lt, 17+51 rt, 18+02 rt, 19+11 rt, 20+14 rt, 20+56 rt, 26+33 to 29+09 rt, 27+36 to 27+94 lt, 30+64 rt, 31+93 rt, 32+46 rt, 33+34 lt, 35+87 lt, 37+10 rt, 37+10 lt, 38+32 rt, 38+32 lt, 39+54 rt, 39+54 lt, 40+92 rt and lt, 42+31 rt, 43+68 rt, 47+98 lt, 48+16 lt, 48+80 lt, 57+80 lt, 62+74 rt, 63+80 rt, 64+75 rt, 28+61 rt and 29+08 rt	ELECTRIC A
35040-6503	21053415201	electric	single phase 7200 volt underground lateral extending left Sta 35+87	lateral extending left of Sta 35+87	90 for all activities in this category	pending DOT or its contracted agency staking of existing or proposed right-of-way and the staking of DOT fencing at Sta 12+02 (rt)	To be installed: 3+43 rt 2.0 rt of existing pole, 4+06 rt 2.0 rt of existing pole, 4+13 lt @ right-of-way, 4+51 rt 2.0 rt of existing pole, 4+54 lt ROW, 5+13 lt ROW, 5+80 lt ROW, 9+14 lt 3.0 left of existing pole, 10+43 lt 7.0 from edge of traveled lane, 11+17 rt @ proposed ROW, 12+02 rt @ proposed DOT fence, 12+90 rt @ proposed ROW, 13+78 rt, 14+68 rt, 15+52 rt @ ROW, 16+53 rt @ ROW, 16+57 lt 2.0 left of existing pole, 17+51 rt @ ROW, 18+02 rt @ ROW, 19+11 rt @ ROW, 20+10 lt, 20+54 rt, 26+33, 27+23, 27+94, 28+61 & 29+09 rt @ ROW, 27+36, 27+94 lt, 30+56 rt @ ROW, 31+48 @ ROW, 32+42 rt @ 8.0 from traveled lane, 33+34 rt @ proposed ROW, 35+93 lt @ proposed ROW, 36+90 lt rt @ proposed ROW, 36+90 lt 10.0 from traveled lane, 37+93 rt @ proposed ROW 37+93 lt 11.0 from travled lane, 39+00 rt @ proposed ROW, 39+00 lt 12.0 from traveled lane, 40+04 rt @ proposed ROW, 40+04 lt @ limit of const., 40+92 rt @ proposed ROW, 41+85 rt @ proposed ROW, 42+78 @ proposed ROW, 43+68 rt @proposed rOW, 44+03 lt and rt 8.0 from travled lance, 48+16 lt @ proposed ROW, 48+80 lt @ proposed ROW, 57+80 rt	ELECTRIC A
35040-6503	21053415201	electric	anchors and down guys	Sta 21+57 (rt), Sta 23+39 (lt), Sta 34+60 (rt), Sta 46+37 (lt), Sta 49+50 (lt)	90 for all activities in this category	none	anchors and downguys to be relocated to clear zone and/or outside of construction limits	ELECTRIC A
35040-6503	21053415201	cable	750 and 500 coaxial overhead cable with .25" strand	Sta 3+43 to 30+56	not given	electric pole relocation complete	Cable lines will be relocated to the new power pole locations of both power companies.	Comcast cable

ELECTRIC B

Day No	Operation and Location	Date	Hours Worked	Personnel: Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Equipment: Active	Idle	Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
1	Contractor cutting and trimming trees for new power line	2/15/99	8		1	3		3		mulcher, farm tractor, 2 bucket trucks, 1 pickup truck		no effect all day	5	acceptable all day	dry
2	Contractor cutting and trimming trees for new power line Utility co personnel unloading material on project	2/16/99	9		2	5		3		truck crane, mulcher, 1 farm tractor, 3 bucket trucks, 2 pickup trucks, 1 pole trailer		no effect all day	5	acceptable all day	dry
3	Contractor placing new power poles @ Sta 165+76, 167+01, 168+23, 169+44 rt of rwy (Musgrove Const co) Contractor cutting and trimming trees for new power line	2/17/99	8		3	7		4		truck crane, 2 mulchers, 1 farm tractor, 3 bucket trucks, 4 pickup trucks, 1 pole trailer, 1 auger truck		no effect all day	5	acceptable all day	dry
4	Contractor placing new power poles @ Sta 165+77, 164+57, 172+33, 173+40 rt of rwy (Musgrove Const co) Contractor cutting and trimming trees for new power line	2/18/99	9		2	7		4		truck crane, mulcher, 1 farm tractor, 2 bucket trucks, 3 pickup trucks, 1 pole trailer, 1 auger truck		no effect all day	5	acceptable all day	dry
5	Sub placed new oh electric poles at 174+43 rt rwy, 175+50 rt rwy, 176+55 rt rwy, 177+70 rt rwy, 178+72 rt rwy, 173+25 lt rwy, 171+75 lt rwy Trimming and cutting tress @ 181+00 to 183+70 rt rwy and 188+50 to 191+00 rt rwy	2/22/99	9		2	6				1 farm tractor, 3 bucket trucks, 1 dump truck, 2 picku trucks, 1 auger truck, 1 chipper, 1 wood mover		no effect all day	5	acceptable all day	wet
6	Sub Sta 160+00 rt Rwy, 165+51 pulling rope used to pull and place power lines with pilot and tension brake trailers, installed guides, poles @ Sta 160+70 rt rwy, Sta 162+70 rt rwy, Sta 163+77 rt rwy are new, trim crew cutting trees @ Sta 181+00 to 191+0	2/23/99	9		2	6				2 bucket trucks, 1 auger truck, 2 pickup trucks, 1 pilot trip trailer, 1 brake trailer		no effect all day	5	acceptable all day	dry
7	Subcontractor (Musgrove Const. Corp)	2/24/99	9		1	1	1			1 bucket truck, 1 pickup truck, 1 auger truck, 1 pilot trip, 1 tension brake		no effect all day	5	acceptable all day	wet
8	Sub (Musgrove) line crew pulling cable Sta 160+00 to 178+72 rt rwy. Tri County Electric Co-op engineer and foremen restaking pole running lines 185+00 to 192+00	2/25/99	9	1--5 hrs	1--9 hrs, 1 -5 hrs	1	1			1 bucket truck, 3 pickup trucks, 1 auger truck, 1 pilot trip machine, 1 brake tension		no effect all day	5	acceptable all day	wet
9	Contractor connecting electrical services to new power line	3/1/99	9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck		no effect all day	4	acceptable all day	dry
10	Contractor removing conductors from old power line. Sta 160+40 to 178+00 rt of rwy	3/2/99	6		1	2				1 bucket truck, 1 auger truck					
11	Contractor removing power poles from distribution line placed out of service.	3/3/99	7		1	2				1 pickup truck, 1 auger truck					
12	Utility personnel connecting conductors to new pole @ sta 28+55, rt of rwy. (This is a joint use pole with Florida Power Corp.) Contractor unloading and framing poles.	3/10/99	9		2	6				3 bucket trucks, 4 pickup trucks, 2 auger trucks, and 2 pole trailers					

Day No	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
13	contractor personnel framing and placing poles @ Sta 179+83, 181+00, 182+10, 183+42, 184+66, 186+00 rt of rwy Utility personnel cutting and trimming trees	3/11/99	9		2	4	1			1 mulcher, 3 bucket trucks, 2 pickup trucks, 1 auger truck					
14	Contractor placing new power poles at Staions 186+86, 188+82, 192+18, 193+23, 194+34, 195+55, 196+77, 197+97, 199+19 rt of rwy	3/15/99	9		2	1				2 pickup trucks, 1 auger trucks					
15	Contractor framing and placing new power poles @ 191+10, 189+95, 187+60 rt of rwy	3/16/99	9		2	2				1 bucket truck, 2 pickup trucks, 1 auger truck,	1 pole trailer				
16	Contractor placing pulleys and rope in preparation of placing new conductors onto new power poles.	3/17/99	9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck,					
17	Contractor placing new conductors onto new power poles 178+00 to 199+38, rt of rwy.	3/18/99	10		1	2				1 bucket truck, 1 flatbed truck, 1 pickup truck	1 auger truck				
18															
19	Contractor placing conductors onto new poles Sta 178+08 to 199+38 rt of rwy	3/22/99	9		2	1				1 bucket truck, 2 pickup trucks					
20	Contractor connecting services to new power line, placing transformers onto new power line and electrifying new line	3/23/99	9		2	2				1 bucket truck, 2 pickup trucks	1 auger truck				
21	Contractor connecting services and placing transformers onto new power line	3/24/99	9		2	2				1 bucket truck, 2 pickup trucks					
22	Contractor removing conductors from power line placed out of service Sta 178+00 to 199+38 rt of rwy	3/25/99	9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck					
23	Contractor removing power poles from line placed out of service, Sta 178+00 to 199+38 rt of rwy	3/29/99	9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck					
24	Utility personnel staking for new power line location.	4/12/99	8			2				2 pickup trucks					
25	Contractor placing power poles in preparation of constructing new power lines, Sta 66+00 to 68+20, lt of rwy	4/21/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
26	Contractor placing power poles in preparation of constructing new power lines, Sta 66+00 to 68+20, lt of rwy	4/22/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
27	Contractor placing new power poles in preparation of constructing new power line, Sta 66+00 to 68+20, lt of rwy	4/26/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
28	Contractor framing poles in preparation of placing conductors	4/27/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
29	Contractor placing conductors onto new poles Sta 66+00 to 68+20, lt. of rwy	4/29/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
30	Contractor placing poles and conductors for new powerline, Sta 66+00 to 68+20 lt and rt of rwy	5/3/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
31	Contractor placing poles and conductors for new power line Sta 66+00 to 68+20 lt and rt of rwy	5/4/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 pole trailer, 1 auger truck					
32	contractor energizing new power line and removing conductors and power poles from existing line.	5/5/99	10		2	2									
33	Contractor unloading material on job site.	5/17/99	5		2	2				2 bucket trucks, 2 pickup trucks, 1 pole trailer, 1 auger truck					
34	Contractor placing crossarms and hardwar	5/18/99	10		2	2				2 pickup trucks, 1 auger truck					

Day No	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
35	Contractor placing new poles and placing existing conductors onto new poles.	5/19/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
36	Contractor placing new power poles and placing existing conductors and transformers onto new poles Utility personnel trimming trees for power lines	5/20/99	10		3	4	1			1 mulcher, 4 bucket trucks, 3 pickup trucks, 1 auger truck, 1 pole trailer					
37	Contractor placing existing conductors and transformers onto new power poles.	5/21/99	8		2	1				2 pickup trucks, 1 auger truck					
38	Contractor placing existing conductors and transformers onto new power poles.	5/24/99	10		3	3		2		1 mulcher, 3 bucket trucks, 1 dump truck, 3 pickup trucks					
39	contractor replacing pole and hardware @ Sta 126+80, rt of rwy	5/25/99	10		3	5				1 mulcher, 3 bucket trucks, 1 dump truck, 3 pickup trucks, 1 auger truck					
40	Contractor placing new power pole and connecting existing conductors and transformers Sta 138+90, lt Utility personnel trimming trees.	5/26/99	10		2	4	2			1 mulcher, 3 bucket trucks, 1 dump truck, 2 pickup trucks, 1 auger truck					
41	Contractor placing new pole and attaching existing conductors to new pole @ Sta 98+95, lt	5/27/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
42	Contractor unloading and framing new power poles Contractor placing new poles	5/31/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 pole trailer					
43	Contractor placing new poles Sta 113+00 to 126+20, rt of rwy	6/1/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 pole trailer, 1 auger truck					
44	Contractor placing new poles Sta 113+00 tp 126+20, rt of rwy Contractor unloading and framing poles	6/2/99	10		3	4				3 bucket trucks, 3 pickup trucks, 2 pole trailers, 2 auger trucks					
45	Contractor placing new conductors and hardware onto new power poles, Sta 113+00 to 126+20, rt of rwy Contractor framing power poles.	6/3/99	10		3	5				3 bucket trucks, 3 pickup trucks, 1 pole trailer, 1 auger truck					
46	Contractor framing and placing new power poles.	6/4/99	10		2	2				none					
47	Contractor placing new power poles and placing hardware and conductors onto new poles.	6/7/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
48	Contractor placing new power poles and placing existing conductors onto new poles.	6/8/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
49	Contractor placing new power poles and placing existing conductors onto new poles.	6/9/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
50	Contractor placing existing conductors onto new poles	6/10/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					
51	Contractor placing existing conductors onto new poles.	6/14/99	10		2	2				2 bucket trucks, 2 pickup trucks, 1 auger truck					

ELECTRIC A

Day No.	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
1	Utility company personnel placing stakes for proposed poles	1/26/99	6			1				1 pickup truck		no effect all day	5	acceptable all day	dry
2	Utility company personnel placing stakes for proposed poles.	1/27/99	6			1				1 pickup truck		no effect all day	5	acceptable all day	dry
3	Met w/Diane Freeman of Florida Power & Mr. Burns of Farrens Tree Service to discuss tree trimming operations.	1/28/99	not listed		1	1				2 pickup trucks		no effect all day	5	acceptable all day	dry
4	Contractor trimming trees in preparation of power line relocation. Rt of rwy	2/1/99	8		1--2 hrs	2	2			2 mulchers, 2 bucket trucks, 1 pickup truck, 2 hydraulic saws		no effect all day	3	more than 50% of work day	wet
5	Contractor cutting and trimming trees in preparation of power line relocation.	2/2/99	8 5			2		2		2 mulchers, 2 bucket trucks		no effect all day	3	acceptable all day	wet
6	Contractor cutting and trimming trees prior to power line relocation.	2/3/99	8 5			2		2		2 mulchers, 2 bucket trucks		no effect all day	4	acceptable all day	dry
7	Contractor cutting and trimming trees prior to power line relocation.	2/4/99	8			2		2		2 mulchers, 2 bucket trucks		no effect all day	4	acceptable all day	dry
8	Contractor cutting and trimming trees prior to power line relocation.	2/8/99	8 5		1	3		2		2 mulchers, 1 farm tractor, 2 bucket trucks, 1 pickup truck		no effect all day	5	acceptable all day	dry
9	Utility personnel construction new overhead power line across Sr-53 at Sta 35+92. Utility personnel placing new power poles in preparation of power line relocation at Sta 43+72, 42+72, 42+76, 41+85, 40+93, 40+06, 39+01, 37+94. Contractor cutting and tr	2/9/99	8		2	6	3			2 mulchers, 1 farm tractor, 5 bucket trucks, 1 pole trailer		no effect all day	5	acceptable all day	dry
10	Utility personnel placing new power pole @ Sta. 34+60 rt. Contractor cutting and trimming trees for new power line (Farrens Tree Surgeons)	2/10/99	9		2	6		4		2 mulchers, 1 farm tractor, 4 bucket trucks, 3 pickup trucks, 1 pole trailer		no effect all day	5	acceptable all day	dry
11	Contractor cutting and trimming trees for new power line.	2/11/99	8		1	1		1		1 mulcher, 1 bucket truck, 1 pickup truck		no effect all day	5	acceptable all day	dry
12	Utility company personnel placing new power poles at Sta 26+00, 27+22, 27+94, 28+50, 36+91, 62+80, rt of rwy. Contractor cutting and trimming trees for new power line. (Farrens Tree Surgeons)	2/15/99	8		2	5	3			1 mulcher, 3 bucket trucks, 2 pickup trucks, 1 auger truck, 1 pole trailer		no effect all day	5	acceptable all day	dry
13	Utility personnel unloading material and setting power poles. Also placing conductors on new poles. Contractor cutting and trimming trees for new power line. (Farrens Tree Surgeons)	2/16/99	9		2	3		3		2 mulchers, 1 farm tractor, 3 bucket trucks, 2 pickup trucks, 1 pole trailer		no effect all day	5	acceptable all day	dry
14	Contractor cutting and trimming trees for new power line. Utility personnel unloading material on project.	2/17/99	not listed		2	4		3		2 mulchers, 1 farm tractor, 3 bucket trucks, 1 pickup truck		no effect all day	5	acceptable all day	dry

Day No	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
15	Utility company personnel placing new power poles, Sta 48+00 to 62+00 rt of rwy Contractor cutting and trimming trees for new power line (Farrens Tree Surgeons)	2/18/99	9		2	5		3		3 mulchers, 1 farm tractor, 3 bucket trucks, 2 pickup trucks, 1 auger truck					
16	Subcontractor trimming and cutting trees Sta 27=00 to Sta 37=00 rt rwy F P & Light installed 7 new poles Sta 36=91 lt rwy, 37+94 lt rwy, 39+01 lt Rwy, 40+06 lt Rwy, 40+93 lt Rwy, 48+15 lt Rwy, 48+59 lt Rwy	2/22/99				2-- 8 hrs	1--10 hrs	1--10 hrs		3 bucket trucks, 1 dump truck, 1 auger truck, 1 pole trailer, 1 chipper		no effect all day	5		
17	Florida Power and Light installing guide stems Sta 30+00 to Sta 37+00 rt rwy	2/23/99	6		1	2				1 bucket truck, 1 auger truck		no effect all day	5	acceptable all day	dry
18	Florida Power and Light pulling cable Sta 26+50 to 27+40 transferring service from rt rwy to lt rwy, set new pole at 27+40 lt rwy and placing underground cable 26+50 to 27+40 rt rwy	2/24/99	8		2	2				2 bucket trucks, 1 pickup truck, 1 trencher, 1 auger truck, 1 flat bed trailer		no effect all day	4	acceptable all day	wet
19	Florida Power and Light setting pole and anchor Sta 44+03 rt rwy	2/26/99	2		1	1				1 bucket truck, 1 auger truck, 1 pole trailer		no effect all day	5	acceptable all day	dry
20	Utility company personnel unloading and placing wooden power poles Sta 4+50 to 9+20, lt of rwy	3/3/99	8		1	2				1 crane truck, 1 pickup truck, 1 auger truck		effected less than 50% of day	3	more than 50% of work day	wet
21	Utility personnel connecting power line crossing SR-53 @ Sta 28+55 to new power line running parallel to SR-53 (This is a joint use pole with Tri-County Electric Corp) Utility personnel placing conductors on new power poles, Sta 37+20 to 44+62, rt of	3/10/99	8		1	6				3 bucket trucks, 2 pickup trucks, 1 auger truck, 1 pole trailer		no effect all day	5	acceptable all day	dry
22	Utility personnel removing conductors from old power ine, Sta 37+20 to 44+62, rt of rwy.	3/11/99	5		1	3	2			3 bucket trucks, 1 pickup truck, 2 auger trucks		no effect all day	5	acceptable all day	dry
23	Utility personnel placing wooden power poles between Sta 4+00 to 10+00 lt of rwy	3/17/99	4		1	4				1 truck crane, 1 bucket truck, 1 pickup truck, 1 auger truck		no effect all day	5	acceptable all day	dry
24	Utility personnel spotting new concrete piles throughout the project.	4/6/99	8		1	6	2			1 truck crane, 1 transport, 2 pickup trucks, 2 auger trucks	2 bucket trucks, 1 log skidder	no effect all day	5	acceptable all day	dry
25	Utility personnel placing concrete power poles, Sta 10+00 to 14+00 lt.& rt	4/14/99	8		1	8				1 truck crane, 1 transport, 2 bucket trucks, 1 auger truck		no effect all day	5	acceptable all day	dry
26	Installing insulators on new poles and getting ready to string cable 11+82 to 16+00 rt rwy r/w	5/11/99	10		1	4				2 bucket trucks, 2 pickup trucks		not available	5	acceptable all day	dry
27	Continued installing insulators in preparation for stringing cable on new poles u/s rt cl const S r No 53 from Sta 16+00 to Sta 19+10 (4 ea poles) (extreme Sta's used)	5/12/99		1--5 hrs	1--9 hrs	3--9 hrs each				2 bucket trucks, 1 pickup trucks, hand tools		no effect all day	4	acceptable all day	dry

Day No.	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions
				Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle				
28	Continued installing insulators and guy anchors in preparation for stringing cable on new poles--o/s rt centerline SR No 53 from Sta 20+50 to 29+15 (3 ea poles) (extreme sta's used) Removed old o/e power service & pole to existing residence -o/s rt cl	5/13/99		1--5 hrs	1--9 hrs, 1 -7.0 hrs	1--9 0 hrs, 3--7 hrs ea	1--7.0 hrs			2 bucket trucks, 2 bucket trucks with auger unit, 1 pickup truck, 1 pole trailer, hand tools		no effect all day	4	acceptable all day	dry
29	Contractor verbally assisting Comtel w/ their O/E cable locations on FPL poles	5/14/99	1	1						1 pickup truck		no effect all day	4	acceptable all day	dry
30	Utility personnel placing conductors for new power line and removing existing conductors @ various locations.	5/17/99	8		1	4	2			3 bucket trucks, 2 pickup trucks, 1 pole trailer		no effect all day	5	acceptable all day	dry
31	Utility personnel placing conductors for new power line.	5/18/99	8		1	4	2			3 bucket trucks, 2 pickup trucks		no effect all day	5	acceptable all day	dry
32	Utility personnel placing conductors for new power line	5/19/99	8		1	4	3			2 bucket trucks, 2 pickup trucks, 1 auger truck, 1 pole trailer		no effect all day	5	acceptable all day	dry
33	Utility personnel placing conductors for new power line	5/20/99	8		1	3	1			1 bucket trucks, 1 pickup truck, 1 auger truck		no effect all day	5	acceptable all day	dry
34	Contractor connecting services to new power line	5/24/99	7		1	3	2			2 bucket trucks, 2 pickup trucks, 1 auger truck		no effect all day	5	acceptable all day	dry
35	Utility personnel placing hardware onto new poles and connecting services Sta 11+00 to 28+00	5/25/99	not available		2	6	2			4 bucket trucks, 2 pickup trucks, 1 auger truck		no effect all day	5	acceptable all day	dry
36	Utility personnel placing conductors @ road crossing locations.	5/26/99	7		2	6	3			4 bucket trucks, 2 pickup trucks, 1 auger truck		no effect all day	5	acceptable all day	dry
37	Utility personnel removing old power poles Utility personnel connecting services to new power line	5/27/99	7		2	6	3			3 bucket trucks, 2 pickup trucks, 2 auger trucks		no effect all day	5	acceptable all day	dry
38	Utility personnel removing old power poles.	6/1/99	7		1	2		1		1 bucket truck, 1 auger truck		no effect all day	5	acceptable all day	dry
39	Utility personnel connectin services to new power line.	6/2/99	7		1	4	3			not available		no effect all day	5	acceptable all day	dry
40	Utility personnel removing old poles and connecting services to new line	6/3/99	7		2	4	3			2 bucket trucks, 2 pickup trucks, 1 auger truck, 1 pole trailer		no effect all day	5	acceptable all day	dry

MUNIICIPAL FORCE ACCOUNT/ELECTRIC A

Day No	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
1	Contractor cutting and trimming trees for new power line	2/15/99											8		1	3		3		2 bucket trucks, 1 farm tractor, 1 mulcher, 1 pickup truck	
2	Contractor cutting and trimming trees for new power line. Utility personnel unloading material on project.	2/16/99		9		1	3				1 truck crane, 1 pole trailer, 1 pickup truck		9		1	3				3 bucket trucks, 1 pickup, 1 mulcher, 1 tractor	
3	Contractor placing new power poles @ Sta 165+76, 167+01, 168+23, 169+44, rt of rwy	2/17/99		8		1					1 pickup truck		8		2	7	4			4 pickup trucks, 3 bucket trucks, 1 truck crane, 1 pole trailer, 1 auger truck, 2 mulchers, 1 farm tractor	
4	Contractor placing new power poles @ Stas 163+77, 164+57, 172+33, 173+40, rt of rwy. Utility personnel trimming trees	2/18/99	4 wooden poles	9		1	5				2 pickups, 1 mulcher, 1 bucket truck, 1 farm tractor		9		1	2	1			1 pickup, 1 bucket truck, 1 truck crane, 1 pole trailer	
5	SR 53 Madison Co (lump sum reimbursement)	2/22/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck	
6	SR 53 Madison Co (lump sum reimbursement)	2/23/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck, 1 ton pilot trip machine, 1 tension brake	
7	SR 53 Madison Co (lump sum reimbursement)	2/24/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck, 1 ton pilot trip machine, 1 tension brake	
8	no information listed	2/25/99		5	1 engineer	1							9		1	1	1				
9	Contractor connecting electrical services to new power line	3/1/99											9		1	2				1 bucket truck, 1 pickup truck	
10	Contractor removing conductors from old power line Sta 160+40 to 178+00 rt of rwy	3/2/99											6		1	2				2 bucket trucks, 1 pickup	
11	Contractor removing power poles from distribution line placed out of service	3/3/99											7		1	2				1 bucket truck, 1 auger truck	
12	Contractor unloading and framing poles. Utility personnel connecting conductors to new poles @ 28+55 rt of rwy. (This is a joint use pole w/ Florida Power Corp.)	3/10/99		9		1	4				1 pickup, 2 bucket trucks, 1 pole trailer		9		1	2				1 pickup, 1 auger truck, 1 bucket truck	
13	Contractor personnel framing and placing poles @ Sta 179+83, 181+00, 182+10, 183+42, 184+66, & 186+00 rt of rwy	3/11/99		9		1	3				2 bucket trucks		9		1	2				1 bucket truck, 1 auger truck, 1 pickup	
14	Contractor placing new power poles @ Sta 186+86, 188+82, 192+18, 193+23, 194+34, 195+55, 196+77, 197+97, & 199+19, rt of rwy	3/15/99	9 wooden power poles	3		1					1 pickup		9		1	1				1 pickup, 1 auger truck	
15	Contractor framing and placing power poles @ Sta 191+10, 189+95, 187+60, rt of rwy	3/16/99	3 wooden power poles	8		1					1 pickup		9		1	2				1 pickups, 1 bucket truck, 1 auger truck	
16	Contractor placing pulleys and rope in preparation of placing new conductors.	3/17/99		8		1					1 pickup		9		1	2				1 pickup, 1 bucket truck	
17	Contractor placing new conductors onto new power poles. Sta 178+00 to 199+38, rt of rwy	3/18/99		8		1					1 pickup		10		1	2				1 bucket truck, 1 flatbed truck, 1 pickup truck	

Day No	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
18	Contractor placing conductors onto new poles Sta 178+00 to 199+38, rt of rwy	3/22/99		8		1					1 pickup		9		1	1				1 bucket truck, 1 pickup truck	
19	Contractor connecting services to new power line, placing transformers onto new power line & electrifying new line	3/23/99		6		1					1 pickup		9		1	2				1 bucket truck, 1 pickup truck	
20	Contractor connecting services and placing transformers onto new power line	3/24/99		9		1					1 pickup		9		1	2				1 bucket truck, 1 pickup truck	
21	Contractor removing conductors from power line placed out of srvice, Sta 178+00 to 199+38 rt of rwy	3/25/99											9		1	2				1 pickup, 1 bucket truck, 1 auger truck	
22	Contractor removing power poles from line placed out of service, Sta 178+00 to 199+38, rt of rwy	3/29/99											9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck	
23	Utility personnel staking for new power line location.	4/12/99		8			2				2 pickups										
24	Contractor placing new power poles in preparation of constructing new power line Sta 66+00 to 68+20	4/21/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
25	Contractor placing power poles in preparation of constructing new power line, Sta 66+00 to 68+20, lt of rwy	4/22/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
26	Contractor placing power poles in preparation of constructing new power line, Sta 66+00 to 68+20, lt of rwy	4/26/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
27	Contractor framing poles in preparation of placing conductors.	4/27/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
28	Contractor placing new conductors onto new poles, Sta 66+00 to 68+20, lt of rwy	4/29/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
29	Contractor placing new conductors onto new poles, Sta 66+00 to 68+20, lt & rt of rwy	5/3/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
30	Contractor placing conductors for new power line, Sta 66+00 to 68+20, lt and rt of rwy	5/4/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
31	Contractor energizing new power line and removing conductors and poles from existing line.	5/5/99		10		1					1 pickup		10		1	2				1 pickup, 1 auger truck, 1 pole truck, 2 bucket trucks	
32	Contractor unloading material on job site.	5/17/99		5		1					1 pickup		5		1	2				1 auger truck, 1 pickup truck	
33	Contractor placing cross arms and hardware onto new poles.	5/18/99		10		1					1 pickup		10		1	2				1 pickup truck, 2 bucket trucks, 1 auger truck	
34	Contractor placing new poles and placing existing conductors onto new poles.	5/19/99		10		1					1 pickup		10		1	2				1 pickup truck, 2 bucket trucks, 1 auger truck, 1 pole trailer	
35	Contractor placing new power poles and placing existing conductors and transformers onto new power poles. Utility personnel trimming trees for lines.	5/20/99		7		2	2				2 pickup trucks, 2 bucket trucks, 1 mulcher		10		1	2				1 pickup, 1 bucket truck, 1 auger truck	
36	Contractor placing existing conductors and transformers onto new power poles.	5/21/99		8		1					1 pickup truck		8		1	2				1 pickup, 1 bucket truck	
37	Contractor placing existing conductors and transformers onto new power poles. Utility personnel trimming trees for power line.	5/24/99		10		2	2		2		2 pickups, 2 bucket trucks, 1 mulcher, 1 dump truck		10		1	1				1 pickup, 1 bucket truck	
38	Contractor replacing pole and hardware @ Sta 126+80, rt of rwy. Utility personnel trimming trees for new power line.	5/25/99		10		2	3				2 pickups, 1 bucket truck, 1 mulcher, 1 dump truck		10		1	2				1 pickup, 1 bucket truck, 1 auger truck	

Day No	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
39	Contractor placing new power pole and connecting existing conductors and transformers to new pole. Sta 138+90 lt Utility personnel trimming trees	5/26/99		8		1	2	2			1 pickup, 1 bucket truck, 1 mulcher, 1 dump truck		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck	
40	Contractor placing new pole and attaching existing conductors to new pole Sta 98+95 lt	5/27/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck	
41	Contractor placing hardware onto new poles and placing new poles	5/31/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 pole trailer	
42	Contractor placing new poles, Sta 113+00 to Sta 126+20, rt of rwy	6/1/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck,1 pole trailer	
43	Contractor placing new poles, Sta 113+00 to Sta 126+20, rt of rwy Contractor unloading and framing poles	6/2/99		10		1					1 pickup		10		2	4				3 bucket trucks, 2 pickups, 2 auger trucks, 2 pole trailers	
44	Contractor placing new conductors and hardware onto new power poles, Sta 113+00 to 126+20, rt of rwy Contractor framing power poles	6/3/99		10		1					1 pickup		10		2	4				3 bucket trucks, 2 pickups, 1 auger truck, 1 pole trailer	
45	Contractor framing and placing power poles	6/4/99		8		1					1 pickup		8		1	2				1 bucket truck, 1 pickup truck	
46	Contractor placing new power poles and placing hardware and conductors onto new poles	6/7/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
47	Contractor placing new power poles and placing existing conductors and transformers onto new poles	6/8/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
48	Contractor placing new power poles and placing existing conductors onto new poles	6/9/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
49	Contractor placing existing conductors onto new poles	6/10/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
50	Contractor placing existing conductors onto new poles.	6/14/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time (days)	Dependent Activities	Activity/Offset	Utility Agent/ Owner
210534-1 52-01	35040-6503	phone(buried)	cable with 2" PVC conduit	sta 3+60 (lt to rt)	1	Prior to constr.	sta 3+60 (lt crossing rt) place cable out of service, jack and bore tele cable w/(1)-2" PVC at 96" min depth	PHONE
210534-1 52-01	35040-6503	phone (aerial)	cable	sta 4+10 (lt to rt) at 4+51.50	1	Prior to constr.	relocate aerial telephone cable to new power pole location	PHONE
210534-1 52-01	35040-6503	phone(buried)	cable	sta 4+46 to 10+78 lt	5	Prior to constr.	place cable out of service. Bury tele cable one meter of right of way at 30" min depth	PHONE
210534-1 52-01	35040-6503	phone	cable	12+98.75 lt	1	Prior to constr.	relocate pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 15+64.5 to 18+00 lt	2	Prior to constr.	place cable out of service. Bury tele cable one meter of right of way at 30" min depth	PHONE
210534-1 52-01	35040-6503	phone (aerial)	cable	Sta 20+14.207 to 26+35.5 rt	3	Prior to constr.	relocate aerial cable to new power pole locations	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 20+26.5 lt	1	Prior to constr.	relocate pedestal two meters north and one meter right	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 25+23, 25+44, 27+37.266, 27+95 and 30+47.5	4	Prior to constr.	relocate pedestals to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 25+23 to 26+75 lt	2	Prior to constr.	place cable out-of-service and bury telephone cable 1 m off (lt) right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 26+35.5 rt	1	Prior to constr.	relocate telephone pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 26+33.5 to 29+08.5 rt	2	Prior to constr.	place cable out-of-service and bury telephone cable 1 m off (lt) right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 29+08.5 rt	1	Prior to constr.	relocate pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 33+35 to 48+18	9	Prior to constr.	place cable out-of-service and bury telephone cable 1 m off (lt) right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 36+00, 36+13, 40+36, 40+90 lt	3	Prior to constr.	relocate telephone pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 40+90 (lt crossing to rt)	1	Prior to constr.	relocate pole to lt of ROW and relocate aerial cable to new pole locations	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 43+69.5 rt	1	Prior to constr.	relocate pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 43+69.5 (rt crossing lt) to 43+94.5	1	Prior to constr.	remove and relocate aerial cable to new power pole location	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 45+37.5, 45+60, 47+45.5, 48+18 lt	3	Prior to constr.	relocate pedestals to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 57+25 (lt to rt) to 57+29.5	1	Prior to constr.	place cable out-of-service and jack and bore cable with (1)-2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 62+73 lt	1	Prior to constr.	relocate pole to right-of-way and adjust aerial drop as required	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 63+37, 66+93.5, and 68+25 lt	2	Prior to constr.	relocate pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 66+93.5 to 73+34 lt	4	Prior to constr.	place cable out-of-service and bury telephone cable 1 m off (lt) right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 68+21.5 (rt crossing lt)	1	Prior to constr.	relocate pedestal and pole (rt) to ROW and remove and relocate aerial cable to 68+25 lt	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 71+10, 71+30, 71+95.5, 72+79 lt	3	Prior to constr.	relocate pedestals 8 meters back	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 71+35 (lt crossing rt)	1	Prior to constr.	place cable out-of-service and jack and bore cable with (2)-2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 71+35 rt	1	Prior to constr.	relocate pedestal to right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 83+22 to 84+51 (rt)	1	Prior to constr.	place out-of-service buried cable and place buried cable 20 meters off CL @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 83+22 (rt)	1	Prior to constr.	relocate pedestal to 20 meters off centerline	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 89+92 to 128+41 (lt)	25	Prior to constr.	place 2 cables out-of-service. Bury new cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 89+92 (lt crossing rt)	1	Prior to constr.	place cable out-of-service; jack and bore cable with (1) 2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 89+92, 91+42, 92+35, 93+71.5, 94+56, 94+94, 95+92 (lt)	5	Prior to constr.	relocate pedestals to one meter off right-of-way	PHONE

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time (days)	Dependent Activities	Activity/Offset	Utility Agent/ Owner
210534-1 52-01	35040-6503	phone	aerial cable	Sta 94+56 (rt crossing lt)	1	Prior to constr	remove aerial cable and relocate to new pole location	PHONE
210534-1 52-01	35040-6503	phone	poles	Sta 94+56 and 98+67 lt	1	Prior to constr	relocate poles to 1 meter off right-of-way	PHONE
210534-1 52-01	35040 6503	phone	pedestals	Sta 99+46, 101+24 107+23, 108+68, and 110+38	3	Prior to constr	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	cable	Sta 111+12 to 111+38 (rt)	1	Prior to constr	bury cable 1 meter off right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	pedestal	Sta 111+38 lt	1	Prior to constr	place new telephone pedestal one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 111+38 rt crossing lt	1	Prior to constr	jack and bore buried cable with (1)-2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 112+30, 112+44.5, 113+83, 118+98 and 119+69	2	Prior to constr	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	pedestal	Sta 119+69 lt	1	Prior to constr	relocate pedestal to 0.05 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 120+78, 124+32 126+83, 127+69, 127+71 and 128+41	4	Prior to constr	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	poles	Sta 126+82 lt	1	Prior to constr.	relocate pole to .05 m off ROW	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 126+83 lt crossing rt	1	Prior to constr.	remove aerial cable and relocate to new pole location	PHONE
210534-1 52-01	35040-6503	phone	cable and pedestal	Sta 128+41 (lt crossing rt) to 128+39	1	Prior to constr	place 3 cables out-of-service. Jack and bore cable with (2)-2" PVC @ 48" minimum depth. Place pedestal rt and lt.	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 128+30 to 131+98 rt	5	Prior to constr	Place cable out-of-service. Directional bore phone cable with (2)-2" PVC @ 36" minimum depth.	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 131+98 to 142+50 rt	7	Prior to constr	Place 2 cables out-of-service. Bury new cable 20 meters off centerline minimum depth.	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 142+50 to 153+41.5 rt	7	Prior to constr	place cable out-of-service and direct bury cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 128+57.5, 129+51, 130+00, 131+98 rt	3	Prior to constr	relocate pedestals to 20 meters off centerline	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 131+98 (rt crossing to lt)	1	Prior to constr.	remove aerial cable and relocate to new pole location	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 136+53, 136+57.5, 137+20, 138+09.5, 141+80.5, 141+86.5, 141+92.5, and 142+21 rt	5	Prior to constr	relocate pedestals to 20 meters off centerline	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 153+41.5 to 155+39 rt	3	Prior to constr	place cable out-of-service and directional bore buried cable with (1) 2" PVC--1 meter off right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 144+98.5 to 145+79 (lt)	1	Prior to constr.	place cable out-of-service and bury telephone cable 1 m off (lt) right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 144+98.5 to 145+79 (lt)	1	Prior to constr.	relocate pedestals to 1 meter off right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 145+79 (rt crossing lt)	1	Prior to constr.	place cable out-of-service and jack and bore with (1)-2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 145+79, 146+10, 146+80, 148+32.5, and 149+46.5 rt	2	Prior to constr.	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 147+85 to 146+29.5 lt	1	Prior to constr.	place cables out-of-service and bury cable 1 meter off right-of-way @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 148+29.5 (lt crossing to rt)	1	Prior to constr.	place cables out-of-service and jack and bore with (1)-2" PVC @ 48" minimum depth	PHONE

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time (days)	Dependent Activities	Activity/Offset	Utility Agent/ Owner
210534-1 52-01	35040-6503	phone	pedestals	Sta 153+41.5 155+38, 157+55 158+85, 160+08 161+47, 163+94 165+75, 170+16 170+83, 174+43.5 176+69.5, 179+33, 179+49, 182+65, 183+40, 185+97, 188+52, 191+06.5, 193+82.5 rt	10	Prior to constr	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 155+38 (rt crossing to lt) at 155+78	1	Prior to constr	place cable out-of-service and jack and bore with (1)-2" PVC @ 48" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 155+38 to 163+94 rt	5	Prior to constr	place cable out-of-service and direct bury cable @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 163+94 to 165+75 rt	2	Prior to constr	place cable out-of-service and direction bore cable with (1)-2" PVC @ 30" minimum depth	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 165+75 to 170+83 rt	3	Prior to constr.	place cable out-of-service and direct bury cable @ minimum depth to clear proposed excavation	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 170+83 to 172+60 rt	1	Prior to constr.	place cable out-of-service and direct bury cable @ 30" minimum depth 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 172+60 to 174+43.5 rt	3	Prior to constr	place cable out-of-service and directional bore cable @ 30" minimum depth 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 174+43.5 t 180+57 rt	4	Prior to constr.	place cable out-of-service and direct bury cable @ minimum depth to clear proposed excavation and 3 meters of edge of pavement	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 180+57 to 183+40 rt	3	Prior to constr	place cable out-of-service and directional bore cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 183+40 to 184+68	4	Prior to constr	place cable out-of-service and direct bury cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 184+68 to 187+45 rt	4	Prior to constr	place cable out-of-service and direct bury cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	not available	3	Prior to constr	place cable out-of-service and directional bore cable @ 30" minimum depth and 1 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	buried cable	Sta 188+52 to 199+38.85 rt	8	Prior to constr	place cable out-of-service and direct bury cable @ minimum depth to clear proposed excavation and 3 meters off edge of pavement	PHONE
210534-1 52-01	35040-6503	phone	pedestals	Sta 155+78, 170+21.5 and 183+49.5 lt	3	Prior to constr	relocate pedestals to one meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 170+16 (rt crossing to lt) at 170+21.5	1	Prior to constr.	remove aerial cable and relocate to new pole location	PHONE
210534-1 52-01	35040-6503	phone	poles	Sta 170+21.5, 183+49.5, and 185+54.5 lt	1	Prior to constr.	relocate poles to 0.05 meter off right-of-way	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 183+40 (rt crossing lt) at 183+49.5	1	Prior to constr	remove aerial cable and relocate to new pole location	PHONE
210534-1 52-01	35040-6503	phone	aerial cable	Sta 185+54.5 (lt crossing rt) to 185+97	1	Prior to constr	remove and relocate aerial cable to new pole locations	PHONE
210534-1 52-01	35040-6503	phone	pedestal	Sta 199+38.85 rt	1	Prior to constr.	place pedestal 1 meter off right-of-way	PHONE
				Total relocation time requested:	204	days		

PHONE

Day No	Operation and Location	Date	Hours Worked	Personnel: Supt	Foreman	Skilled	Semi skilled	Common	Trainee	Equipment: Active	Idle	Effects of Weather on major work items	Working Conditions 1 (bad) to (excellent)	Duration of acceptable conditions	Soil conditions	
1	(1)Sub directional drilling for purpose of placing conduit, Sta 164+64 to Sta 165+75 17m rt of cl const (2)Sub placing conduit sta 164+64 to sta 165+75, 17m rt of cl const (3)Sub directional drilling for purpose of placing conduit, sta 163+88 to	1/12/99	8		1	2				1 pump, 2 pickup truck, 2 flatbead trailer, 1 directional rig		no effect all day	5	acceptable all day	wet	
2	(1)Sub directional drilling for purpose of placing conduit, Sta 154+15 to Sta 155+35 27m rt of cl const (2)Sub placing conduit, sta 154+15 to sta 155+35, 27m rt of cl const (3)Sub directional drilling for purpose of placing conduit, sta 129+51 to	1/13/99	8		1	2				1 pump 2 pickup truck, 2 flatbead trailer, 1 directional rig		no effect all day	5	acceptable all day	wet	
3	Sub directional drilling for purpose of placing conduit, Sta 130+75 to Sta 132+00 20m rt of cl const	1/14/99	8		1	2				1 pump 2 pickup truck, 2 flatbead trailer, 1 directional rig		no effect all day	4	acceptable all day	wet	
4	Sub directional drilling for purpose of placing conduit Sta 132+00 to Sta 133+95 20m rt of cl const	1/19/99	8		1	2				1 pump 2 pickup truck, 1 flatbead trailer, 1 directional rig		no effect all day	4	acceptable all day	dry	
5	(1)Sub directional drilling for purpose of placing conduit, Sta 133+95 to Sta 135+00 20m rt of cl const (2)Sub placing conduit sta 135+75 to sta 137+21 20m rt of cl const	1/20/99	8		1	2				1 pump 2 pickup truck, 1 flatbead trailer, 1 directional rig		no effect all day	4	acceptable all day	dry	
6	Sub directional drilling for purpose of placing conduit, Sta 128+00 to Sta 129+51 23m rt of cl const	1/21/99	8		1	2				1 pump 2 pickup truck, 1 flatbead trailer 1 directional rig		no effect all day	4	acceptable all day	dry	
7	Sub directional drilling for purpose of placing conduit, Sta 172+61 to Sta 174+22 18m rt of cl const	1/26/99	10		1	1				1 pump 1 pickup truck 1 flatbead trailer 1 directional rig		no effect all day	5	acceptable all day	dry	
8	Sub locating existing underground telephone lines in preparation of placing new cable w/trencher	2/2/99	8		1	1		1		2 pickup truck 1 flatbead trailer		no effect all day	3	acceptable all day	wet	
9	Sub placing underground telephone cable w/trencher sta 193+80 to sta 199+38 7m rt of cl	2/5/99	8		1	1		1		1 flatbed truck 1 trencher, 2 flatbead trailers		no effect all day	5	acceptable all day	dry	
10	Sub placing underground telephone cable sta 185+50 to sta 193+80 7m rt of cl	2/8/99	8		1	1		1		1 pickup truck 2 trencher		no effect all day	5	acceptable all day	dry	
11	(1)Sub (Bar Rite) directional drilling for purpose of placing conduit, Sta 144+40 to Sta 145+00, 28.8m rt of cl const (2)Sub (Clifton Const) placing cable, sta 172+61 to sta 185+50, distance from cl varies (3)Sub (H&M Directional Drilling) direction	2/9/99	8		1	1		1		1 air compressor, 1 backhoe, 3 pickup truck, 2 trencher, 2 directional rigs, 5 flatbed trailers		no effect all day	5	acceptable all day	dry	
12	(1)Sub (Clifton Const) placing cable sta 163+70 to sta 172+60, distance from cl varies (2)Sub (H&M Directional Drilling) directional drilling and placing conduit, sta 15+80 to sta 17+00, 14m lt of cl const	2/10/99	8		2	1		1		1 air compressor, 1 backhoe, 3 pickup truck, 2 trencher, 1 directional rigs, 3 flatbed trailers		no effect all day	5	acceptable all day	dry	
13	(1)Sub (Clifton Const) placing cable, sta 154+15 to sta 172+60, 27m rt of cl (2)Sub (H&M Directional Drilling) directional drilling and placing conduit, sta 17+00 to sta 18+00, 14m lt of cl const (3) Sub directional drilling & placing conduit sta 158+8	2/11/99	10.5		2	1		2		1 air compressor, 1 backhoe, 1 generator, 1 pump, 4 pickup truck, 1 trencher, 1 directional rigs, 3 flatbed trailers	1 trencher	no effect all day	5	acceptable all day	dry	
14	(1)Sub (Clifton Const) placing cable, sta 180+15 and trenching thru embankment, rt of roadway (2)Sub (H&M Directional Drilling) directional drilling and placing conduit, sta 180+15 (3) Sub directional drilling & placing conduit sta 155+80	2/12/99	8		2	1		1		1 air compressor, 1 backhoe, 1 generator, 1 pump, 4 pickup truck, 2 trencher, 1 directional rigs, 3 flatbed trailers		no effect all day	5	acceptable all day	dry	
15	(1)Sub (Bar-Rite) directional drilling and placing conduit, Sta 180+80 to Sta 183+30, 17m rt of cl const (2)Sub (H&M Directional Drilling) directional drilling and placing conduit, sta 175+15 to sta 176+80, sta 80+00 to 81+85 18m lt of cl const Ala	2/16/99	11		2	2		1		2 pump, 1 flatbed truck, 4 pick up truck, 3 flatbed trailer, 1 directional drill		no effect all day	5	acceptable all day	dry	
16	(1)Sub (Bar-Rite) directional drilling and placing conduit, Sta 180+80 to Sta 183+30, 17m rt of cl const (2)Sub (H&M Directional Drilling) directional drilling and placing conduit sta 92+80 to sta 93+70 17m lt of cl const	2/17/99	9		2	2		1		2 pump 2 flatbed truck, 3 pick up truck, 3 flatbed trailer, 2 directional drill		no effect all day	5	acceptable all day	dry	

Day No	Operation and Location	Date	Hours Worked	Personnel: Supt	Foreman	Skilled	Semi skilled	Common	Trainee	Equipment: Active	Idle	Effects of Weather on major work items	Working Conditions 1 (bad) to (excellent)	Duration of acceptable conditions	Soil conditions	
17	(1)Sub directional drilling and placing conduit. Sta 179+80 to Sta 180+80 and sta 183+30 to sta 184+70. 17m rt of cl constr (2)Sub (H&M Directional Drilling) directional drilling and placing conduit sta 95+70 to sta 97+25 18m lt of cl constr	2/18/99	9		2	2	1			2 pump 2 flatbed truck 3 pick up truck 3 flatbed trailer 2 directional drill		no effect all day	5	acceptable all day	dry	
18	(1)Sub (CMon) repairing conduit joint which blew apart at sta 183+00 (2)sub (Bore rite) drilling and placing conduit at sta 141+60 to sta 142+00 (3)Sub (H&M Directional Drilling) drilling and placing conduit sta 99+30 to sta 100+15 17m rt	2/22/99	12	2	2	3	1	2		1 air compressor 1 backhoe, 2 pump 2 flatbed 3 pickup truck 2 directional drill 1 water tank trailer, 3 flatbed trailers, 2 reel trailer	1 trencher	no effect all day	5	acceptable all day	wet	
19	(1)Sub (CMon) plowing @ sta 174+50 to sta 180+50, pedestal connections sta 174+45 to sta 180+50 (2)sub (Bore rite) boring at sta 141+70 to sta 142+30 rt, 200' of conduit placed (3)Sub (H&M Directional Drilling) boring sta 151+10 to sta 149+00 rt, rel	2/23/99	11	2	2	3			2	1 backhoe 2 pump 2 flatbed, 3 pickup truck 2 boring machine 1 trencher, 2 water tank trailer, 3 flatbed trailers 2 reel trailer	1 air compressor	no effect all day	5	acceptable all day	dry	
20	(1)Sub (CMon) off jobsite moved onto jobsite late (2)sub (Bore rite) off jobsite moved to Tallahassee (3)Sub (H&M Directional Drilling) boring and placing 2" conduit sta 28+15 to 28+50 lt, sta 28+50 to sta 28+70 rt, sta 27+77 to sta 27+95 lt, sta 26+	2/24/99	11	2	3	3				1 pump, 1 flatbed 2 pickup truck, 1 boring machine, 1 water tank trailer, 1 reel trailers		no effect all day	4	acceptable all day	wet	
21	(1)Sub (CMon) trenching sta 153+43 to 154+00 and pedestal connections Sta 153+43 to 154+00 (2)Sub (H&M Directional Drilling) boring and placing 2" conduit, sta 27+00 to 27+30 lt, sta 33+15 to sta 34+85 lt sta 34+85 to sta 36+55 lt, sta 26+72 to sta 2	2/25/99	12	2	2	3				1 backhoe 1 pump 1 flatbed, 4 pickup truck 1 trencher 1 water tank trailer 1 flatbed trailers	1 air compressor	no effect all day	5	acceptable all day	dry	
22	(1)Sub (CMon) trenching placing cable and pedestal connections Sta 151+00 to 154+00 (2)Sub (H&M Directional Drilling) directional drilling and placing conduit sta 36+80 to 37+81	2/26/99	9	2	2	3				1 backhoe 1 pump, 2 flatbed, 3 pickup truck 1 trencher 1 water tank trailer, 2 flatbed trailers	1 air compressor	no effect all day	5	acceptable all day	dry	
23	(1)Sub directional drilling and placing conduit, sta 37+66 to 39+10 and sta 44+03 to sta 45+37, 17m lt of rdwy	3/1/99	8	1	1	1	1			1 pump 2 pickup truck, 1 directional drill 2 flatbed trailers		no effect all day	4	acceptable all day	dry	
24	(1)Sub directional drilling and placing conduit, sta 44+03 to 45+08 and sta 47+55 to sta 48+19, 17m lt of rdwy and at sta 57+29	3/2/99	7	1	1	1	1			1 pump 2 pickup truck, 1 directional drill, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
25	(1)Sub directional drilling and placing conduit, sta 88+20, 111+35, 111+35, and 148+30 under SR 53 Sub directional drilling and placing conduit under CR-150 22m rt of cl	3/3/99	9	1	1	2	1			1 pump 3 pickup truck, 1 directional drill, 2 flatbed trailers		affected less than 50% of work day	3	more than 50% of work day	wet	
26	Sub directional drilling and placing conduit sta 127+70 and sta 128+36 under SR-53	3/4/99	8	1	1	2	1			1 pump 3 pickup truck, 1 directional drill, 2 flatbed trailers		no effect all day	3	acceptable all day	wet	
27	Sub placing underground phone cable sta 142+80 to sta 151+00, 27m rt of cl	3/10/99	8		1	1		1		1 air compressor, 2 pickup truck, 1 flatbed truck, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
28	Sub placing underground phone cable, sta 135+00 to sta 142+80, 27m rt of cl	3/11/99	8		1	1		1		1 air compressor, 1 pickup truck, 1 flatbed truck, 2 flatbed trailers, 1 trencher		no effect all day	5	acceptable all day	dry	
29	Sub placing underground phone cable, sta 128+00 to sta 135+00, 27m rt of cl	3/12/99	8		1	1		1		1 air compressor, 1 pickup truck, 1 flatbed truck, 2 flatbed trailers, 1 trencher		no effect all day	4	acceptable all day	dry	
30	Sub drilling and placing conduit sta 147+00 to sta 148+00, 28m rt of cl sub drilling under SR-35 at sta 145+80	3/15/99	11		1	1	1			1 pump, 2 pickup truck, 1 directional drill, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
31	Sub drilling and placing conduit, sta 126+95 to sta 127+85, sta 144+80 to 145+80 lt of rdwy and sta 127+85 to 128+33 rt of rdwy Sub drilling and placing conduit under SR 35 at sta 141+40	3/16/99	11		1	2	1			1 pump, 3 pickup truck, 1 directional drill, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
32	Sub drilling and placing conduit sta 108+80 under SR 53 Sub drilling and placing conduit sta 94+80 to 95+70, 17m lt of rdwy	3/17/99	8		1	1	1			1 pump 2 pickup truck, 1 directional drill, 2 flatbed trailers			5	acceptable all day	dry	
33	Sub drilling and placing conduit sta 7+80 to 9+40, 9m lt of rdwy	3/18/99	10		1	1	1			1 pump, 2 pickup truck, 1 directional drill, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	

Day No	Operation and Location	Date	Hours Worked	Personnel: Supt	Foreman	Skilled	Semi skilled	Common	Trainee	Equipment: Active	Idle	Effects of Weather on major work items	Working Conditions 1 (bad) to 5 (excellent)	Duration of acceptable conditions	Soil conditions	
34	Sub drilling and placing conduit sta 6+00 to 7+60 9m R of rdwy	3/22/99	8		1	1	1			1 pump 2 pickup truck 1 directional drill 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
35	Sub drilling and placing conduit sta 4+80 to 6+00 9m R of rdwy	3/23/99	9.5		1	2	1			1 pump 3 pickup truck 1 directional drill 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
36	Sub drilling and placing conduit sta 121+00 to 127+00 14.17m R of rdwy	3/31/99	4		1	1	1			1 backhoe 1 pickup truck, 1 flatbed truck 2 flatbed trailers 1 trencher	1 trencher	no effect all day	5	acceptable all day	dry	
37	Contractor placing telephone cable sta 118+00 to 121+00 17m R of rdwy	4/1/99	5.5		1	1	1			1 backhoe 1 pickup truck 1 flatbed truck 2 flatbed trailers 1 trencher	1 trencher	Effected more than 50% of work day	2	Less than 50% of work day	wet	
38	Sub placing telephone cable sta 107+00 to 118+00 17m R of rdwy	4/2/99	8		1	1	1			1 backhoe 1 pickup truck 1 flatbed truck 2 flatbed trailers 1 trencher	1 trencher	no effect all day	4	acceptable all day	wet	
39	Sub placing telephone cable sta 98+60 to 107+00 17m R of rdwy	4/3/99	N/A		1	1	1			1 backhoe 1 pickup truck 1 flatbed truck 2 flatbed trailers 1 trencher	1 trencher	no effect all day	5	acceptable all day	dry	
40	Sub excavating for purpose of splicing cable and placing pedestals at intersection of CR 150 and SR 53	4/5/99	8		1	1	1			1 backhoe 1 pickup truck 1 flatbed truck 2 flatbed trailers	2 trencher	no effect all day	5	acceptable all day	dry	
41	Sub excavating for purpose of splicing and looping telephone cable into pedestals Sub directional drilling and placing conduit at sta 128+41 under SR 53 Sub splicing new wire into new pedestals	4/6/99	8		3	5	1			1 backhoe 3 pickup truck 2 flatbed truck 3 flatbed trailers 1 directional drill	1 air comp	no effect all day	5	acceptable all day	dry	
42	Sub excavating and placing cable at pedestal locations Sub splicing new cable at pedestal locations	4/7/99	8		2	3	1			1 backhoe 3 pickup truck 1 flatbed truck	1 air comp	no effect all day	5	acceptable all day	dry	
43	Sub placing telephone cable sta 90+00 to 98+60 17m R of rdwy	4/8/99	8		1	1	1			1 air compressor 1 backhoe 1 pickup truck 1 flatbed truck 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
44	Sub placing cable in conduit sta 90+00 under SR 53	4/9/99	N/A		1	1	1			1 air compressor 1 backhoe 1 pickup truck 1 flatbed truck	2 flatbed tr	no effect all day	4	acceptable all day	dry	
45	Sub placing telephone cable sta 83+20 to 84+80 18m rt of cl rdwy	4/12/99	8		1	1				1 backhoe 1 pickup truck 1 flatbed truck 1 trencher	1 air comp	no effect all day	5	acceptable all day	dry	
46	Sub placing telephone cable sta 66+90 to 73+50 11.14m R of cl rdwy Sub placing cable under SR 53 at sta 57+30	4/13/99	8		1	1	1			1 backhoe 1 pickup truck 1 flatbed truck 1 trencher	1 air comp	no effect all day	5	acceptable all day	dry	
47	Sub placing telephone cable sta 40+80 to 48+40 17m R of cl rdwy Sub splicing tele cable at pedestal locations	4/14/99	3.5		1	4	1			1 air compressor, 1 backhoe, 4 pickup truck 1 flatbed truck 1 trencher	2 flatbed tr	no effect all day	5	acceptable all day	dry	
48	Sub placing telephone cable sta 34+20 to 40+80 17m R of cl rdwy Sub splicing tele cable at pedestal locations	4/15/99	8		1	4	1			1 air compressor, 1 backhoe, 4 pickup truck, 1 flatbed truck 1 trencher	2 flatbed tr	no effect all day	4	acceptable all day	dry	
49	Sub placing telephone cable sta 33+40 to 34+20 14.17m R of cl rdwy Sub splicing tel cable at pedestal locations	4/16/99	5		1	4	1			1 air compressor, 1 bulldozer, 4 pickup truck, 1 flatbed truck 1 trencher, 1 flatbed trailer	1 flatbed tr	no effect all day	4	acceptable all day	dry	
50	Sub placing telephone cable R of cl rdwy Sub splicing tele cable at pedestal locations	4/19/99	N/A		2	5		1	1	1 backhoe, 4 pickup truck 1 flatbed truck 1 trencher, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
51	Sub placing telephone cable R of cl rdwy Sub splicing tele cable at pedestal locations	4/20/99	7		2	5		1	1	1 backhoe, 4 pickup truck, 1 flatbed truck 1 trencher, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
52	Sub placing telephone cable R of cl rdwy Sub splicing tele cable at pedestal locations	4/21/99	N/A		2	5		1	1	1 backhoe, 4 pickup truck, 1 flatbed truck 1 trencher, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
53	Sub placing telephone cable R of cl rdwy Sub splicing tele cable at pedestal locations	4/22/99	N/A		2	5		1	1	1 backhoe, 4 pickup truck, 1 flatbed truck 1 trencher, 2 flatbed trailers		no effect all day	5	acceptable all day	dry	

Day No	Operation and Location	Date	Hours Worked	Personnel						Equipment		Effects of Weather on major work items	Working Conditions 1 (bad) to (excellent)	Duration of acceptable conditions	Soil conditions	
				Supt	Foreman	Skilled	Semi skilled	Common	Trained	Active	Idle					
54	Sub placing telephone cable lt of cl rdwy Sub splicing tele cable at pedestal locations	4/23/99	N/A		2	5		1	1	1 backhoe 4 pickup truck 1 flatbed truck 1 trencher 2 flatbed trailers		no effect all day	5	acceptable all day	dry	
55	Sub placing telephone cable lt of cl rdwy	4/26/99	N/A		1	4			1	4 pickup truck		no effect all day	5	acceptable all day	dry	
56	Contractor digin pts at splicing locations Contractor splicing tele cable at pedestal locations	4/27/99	8		3	9		2	1	1 backhoe 2 pickup truck, 1 flatbed truck 1 flatbed trailers		no effect all day	5	acceptable all day	dry	
57	Contractor digin pts at splicing locations Contractor splicing tele cable at pedestal locations	4/28/99	6		3	9		2	1	1 backhoe, 2 pickup truck, 1 flatbed truck 1 flatbed trailers		Effected less than 50% of work day	3	more than 50% of work day	wet	
58	Contractor digin pts at splicing locations Contractor splicing tele cable at pedestal locations Contractor setting poles for aerial crossings	4/29/99	6		4	11		3	1	1 backhoe, 8 pickup truck 3 flatbed truck 2 flatbed trailers, 1 pole trailer, 1 auger truck		no effect all day	5	acceptable all day	dry	
59	Contractor splicing tele cable at pedestal locations	4/30/99	6			4				4 pickup trucks		no effect all day	4	acceptable all day	dry	
60	Contractor splicing tele cable at pedestal locations Contractor backfilling & dressing out pit locations	5/3/99	8		2	8		2		1 backhoe 6 pickup truck, 1 flatbed truck		no effect all day	5	acceptable all day	dry	
61	Contractor splicing tele cable at pedestal locations Contractor backfilling & dressing out pit locations	5/4/99	8		2	8		2		1 backhoe 6 pickup truck, 1 flatbed truck 1 flatbed trailer		no effect all day	5	acceptable all day	dry	
62	Contractor splicing tele cable at pedestal locations and removing old pedestals	5/5/99	8		2	6			1	6 pickup trucks		no effect all day	5	acceptable all day	dry	
63	Contractor splicing tele cable at pedestal locations	5/6/99	8		2	6			1	6 pickup trucks		no effect all day	5	acceptable all day	dry	
64	Contractor splicing tele cable at pedestal locations	5/7/99	2			2				2 pickup trucks		Effected m	2	Less than 5	wet	
65	Contractor backfilling and dressing out pit locations Contractor splicing tele cable at pedestal locations Contractor setting poles for aerial crossings	5/10/99	2.5		2	4				1 bucket truck 2 flatbed truck, 3		no effect all day	5	acceptable all day	dry	
66	Contractor splicing tele cable at pedestal locations near 15+50 lt rdwy	5/11/99	8			2				2 pickup trucks			5	acceptable all day	dry	
67	Contractor not observed on site	5/12/99	2.5								1 backhoe					
68	Excavating pit for relocation of existing tele	5/13/99	5			2				1 backhoe, 1 dump truck, 1 trailer		no effect all day				
69	Contractor not observed on site	5/14/99	5							1 backhoe						

State Number	Project Number	Type of Utility	Utility Description	Location/ Station	Estimated Time (days)	Dependent Activities	Activity/Offset	Utility Agent/ Owner
210534-1-52-01	35040-6503	water	Fire hydrant	sta 128+20 rt	14	Prior to constr	To be relocated to sta 128+48, 30m lt	WATER
210534-1-52-01	35040-6503	water	water meters	various locations from sta 126+40 to sta 154+20 lt and rt	10	Prior to constr	Relocate meters betwn sta 127+20 to sta 133+20 rt.	WATER
210534-1-52-01	35040-6503	water	water meters	various locations from sta 126+40 to sta 154+20 lt and rt	10	during construction	Adjust other meters as necessary.	WATER
				Total relocation time requested:	34			

MADISON COUNTY (FORCE ACCOUNT)

Day No.	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
1	Contractor cutting and trimming trees for new power line.	2/15/99											8		1	3		3		2 bucket trucks, 1 farm tractor, 1 mulcher, 1 pickup truck	
2	Contractor cutting and trimming trees for new power line Utility personnel unloading material on project	2/16/99		9		1	3				1 truck crane, 1 pole trailer, 1 pickup truck		9		1	3				3 bucket trucks, 1 pickup, 1 mulcher, 1 tractor	
3	Contractor placing new power poles @ Sta 165+76, 167+01, 168+23, 169+44, rt of rwy	2/17/99		8		1					1 pickup truck		8		2	7	4			4 pickup trucks, 3 bucket trucks, 1 truck crane, 1 pole trailer, 1 auger truck, 2 mulchers, 1 farm tractor	
4	Contractor placing new power poles @ Stas 163+77, 164+57, 172+33, 173+40, rt of rwy Utility personnel trimming trees	2/18/99	4 wooden poles	9		1	5				2 pickups, 1 mulcher, 1 bucket truck, 1 farm tractor		9		1	2	1			1 pickup, 1 bucket truck, 1 truck crane, 1 pole trailer	
5	SR 53 Madison Co (lump sum reimbursement)	2/22/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck	
6	SR 53 Madison Co (lump sum reimbursement)	2/23/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck, 1 ton pilot trip machine, 1 tension brake	
7	SR 53 Madison Co (lump sum reimbursement)	2/24/99											9		1	1	1			1 pickup, 1 bucket truck, 1 auger truck, 1 ton pilot trip machine, 1 tension brake	
8	no information listed	2/25/99		5	1 engineer	1							9		1	1	1				
9	Contractor connecting electrical services to new power line	3/1/99											9		1	2				1 bucket truck, 1 pickup truck	
10	Contractor removing conductors from old power line Sta 160+40 to 178+00 rt of rwy	3/2/99											6		1	2				2 bucket trucks, 1 pickup	
11	Contractor removing power poles from distribution line placed out of service	3/3/99											7		1	2				1 bucket truck, 1 auger truck	
12	Contractor unloading and framing poles Utility personnel connecting conductors to new poles @ 28+55 rt of rwy. (This is a joint use pole w/ Florida Power Corp.)	3/10/99		9		1	4				1 pickup, 2 bucket trucks, 1 pole trailer		9		1	2				1 pickup, 1 auger truck, 1 bucket truck	
13	Contractor personnel framing and placing poles @ Sta 179+83, 181+00, 182+10, 183+42, 184+66, & 186+00 rt of rwy	3/11/99		9		1	3				2 bucket trucks		9		1	2				1 bucket truck, 1 auger truck, 1 pickup	
14	Contractor placing new power poles @ Sta 186+86, 188+82, 192+18, 193+23, 194+34, 195+55, 196+77, 197+97, & 199+19, rt of rwy	3/15/99	9 wooden power poles	3		1					1 pickup		9		1	1				1 pickup, 1 auger truck	
15	Contractor framing and placing power poles @ Sta 191+10, 189+95, 187+60, rt of rwy	3/16/99	3 wooden power poles	8		1					1 pickup		9		1	2				1 pickups, 1 bucket truck, 1 auger truck	
16	Contractor placing pulleys and rope in preparation of placing new conductors.	3/17/99		8		1					1 pickup		9		1	2				1 pickup, 1 bucket truck	
17	Contractor placing new conductors onto new power poles. Sta 178+00 to 199+38, rt of rwy	3/18/99		8		1					1 pickup		10		1	2				1 bucket truck, 1 flatbed truck, 1 pickup truck	

Day No	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
18	Contractor placing conductors onto new poles Sta 178+00 to 199+38, rt of rwy	3/22/99		8		1					1 pickup		9		1	1				1 bucket truck, 1 pickup truck	
19	Contractor connecting services to new power line, placing transformers onto new power line & electrifying new line	3/23/99		6		1					1 pickup		9		1	2				1 bucket truck, 1 pickup truck	
20	Contractor connecting services and placing transformers onto new power line	3/24/99		9		1					1 pickup		9		1	2				1 bucket truck, 1 pickup truck	
21	Contractor removing conductors from power line placed out of srvice, Sta 178+00 to 199+38 rt of rwy	3/25/99											9		1	2				1 pickup, 1 bucket truck, 1 auger truck	
22	Contractor removing power poles from line placed out of service, Sta 178+00 to 199+38, rt of rwy	3/29/99											9		1	2				1 bucket truck, 1 pickup truck, 1 auger truck	
23	Utility personnel staking for new power line location	4/12/99		8			2				2 pickups										
24	Contractor placing new power poles in preparation of constructing new power line Sta 66+00 to 68+20	4/21/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
25	Contractor placing power poles in preparation of constructing new power line, Sta 66+00 to 68+20, lt of rwy	4/22/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
26	Contractor placing power poles in preparation of constructing new power line, Sta 66+00 to 68+20, lt of rwy	4/26/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
27	Contractor framing poles in preparation of placing conductors	4/27/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
28	Contractor placing new conductors onto new poles, Sta 66+00 to 68+20, lt of rwy	4/29/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
29	Contractor placing new conductors onto new poles, Sta 66+00 to 68+20, lt & rt of rwy	5/3/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
30	Contractor placing conductors for new power line, Sta 66+00 to 68+20, lt and rt of rwy	5/4/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
31	Contractor energizing new power line and removing conductors and poles from existing line.	5/5/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
32	Contractor unloading material on job site.	5/17/99		5		1					1 pickup		5		1	2				1 pickup, 1 auger truck, 1 pole truck, 2 bucket trucks	
33	Contractor placing cross arms and hardware onto new poles.	5/18/99		10		1					1 pickup		10		1	2				1 auger truck, 1 pickup truck	
34	Contractor placing new poles and placing existing conductors onto new poles.	5/19/99		10		1					1 pickup		10		1	2				1 pickup truck, 2 bucket trucks, 1 auger truck	
35	Contractor placing new power poles and placing existing conductors and transformers onto new power poles. Utility personnel trimming trees for lines.	5/20/99		7		2	2				2 pickup trucks, 2 bucket trucks, 1 mulcher		10		1	2				1 pickup truck, 2 bucket trucks, 1 auger truck, 1 pole trailer	
36	Contractor placing existing conductors and transformers onto new power poles.	5/21/99		8		1					1 pickup truck		8		1	2				1 pickup, 1 bucket truck, 1 auger truck	
37	Contractor placing existing conductors and transformers onto new power poles. Utility personnel trimming trees for power line.	5/24/99		10		2	2		2		2 pickups, 2 bucket trucks, 1 mulcher, 1 dump truck		10		1	1				1 pickup, 1 bucket truck	
38	Contractor replacing pole and hardware @ Sta 126+80, rt of rwy. Utility personnel trimming trees for new power line.	5/25/99		10		2	3				2 pickups, 1 bucket truck, 1 mulcher, 1 dump truck		10		1	2				1 pickup, 1 bucket truck, 1 auger truck	

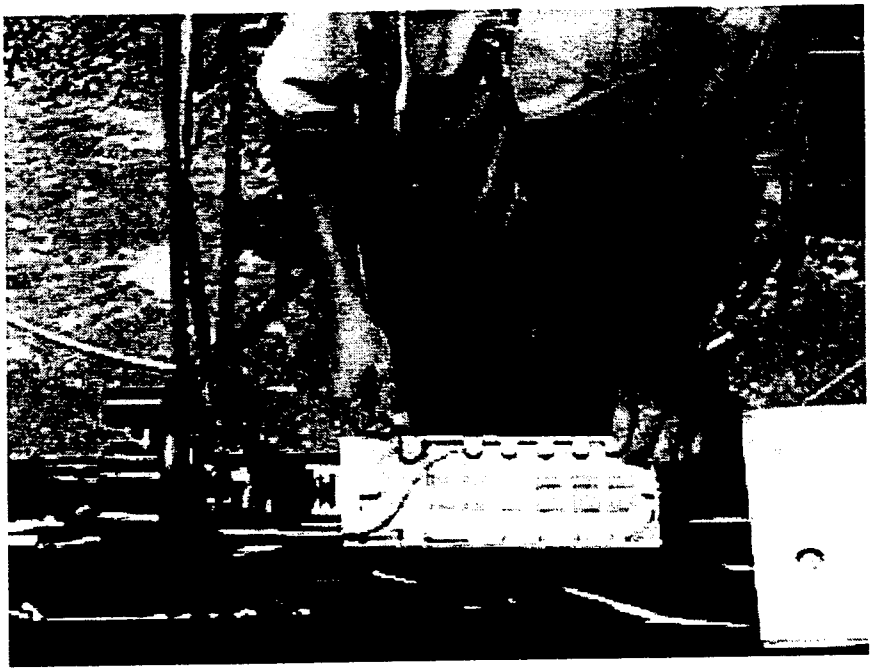
Day No	Operation and Location	Date	Materials Used	Hours Worked	Utility Personnel						Utility Equipment		Hours Worked	Contractor Personnel						Contractor Equipment	
					Supt	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle		Supt.	Foreman	Skilled	Semi-skilled	Common	Trainee	Active	Idle
39	Contractor placing new power pole and connecting existing conductors and transformers to new pole, Sta 138+90 lt Utility personnel trimming trees	5/26/99		8		1	2	2			1 pickup, 1 bucket truck, 1 mulcher, 1 dump truck		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck	
40	Contractor placing new pole and attaching existing conductors to new pole Sta 98+95 lt	5/27/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck	
41	Contractor placing hardware onto new poles and placing new poles	5/31/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 pole trailer	
42	Contractor placing new poles, Sta 113+00 to Sta 126+20, rt of rwy	6/1/99		10		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup, 1 auger truck, 1 pole trailer	
43	Contractor placing new poles, Sta 113+00 to Sta 126+20, rt of rwy Contractor unloading and framing poles.	6/2/99		10		1					1 pickup		10		2	4				3 bucket trucks, 2 pickups, 2 auger trucks, 2 pole trailers	
44	Contractor placing new conductors and hardware onto new power poles, Sta 113+00 to 126+20, rt of rwy Contractor framing power poles.	6/3/99		10		1					1 pickup		10		2	4				3 bucket trucks, 2 pickups, 1 auger truck, 1 pole trailer	
45	Contractor framing and placing power poles.	6/4/99		8		1					1 pickup		8		1	2				1 bucket truck, 1 pickup truck	
46	Contractor placing new power poles and placing hardware and conductors onto new poles	6/7/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
47	Contractor placing new power poles and placing existing conductors and transformers onto new poles	6/8/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
48	Contractor placing new power poles and placing existing conductors onto new poles.	6/9/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
49	Contractor placing existing conductors onto new poles	6/10/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	
50	Contractor placing existing conductors onto new poles	6/14/99		8		1					1 pickup		10		1	2				2 bucket trucks, 1 pickup truck, 1 auger truck	

APPENDIX EIGHT: SUGGESTED TEMPLATE FOR A DAILY REPORT DATABASE

Day Number:	counter
Date:	
Company performing the work:	
Municipal	Y/N
Contractor	Y/N
Personnel for the relocating utility	Y/N
Work performed:	
Area completed:	
Hours Worked:	
Personnel:	
Supt.	
Foreman	
Skilled	
Semi-skilled	
Common	
Trainee	
Active Equipment:	
Idle Equipment:	
Weather Conditions:	
Working Conditions:	
Soil Conditions:	
Effects of weather on major work items:	
Contract quantity increases today:	
General comments:	

The research team feels that this template would be most effective in a database program such as Microsoft Excel.

APPENDIX NINE: SAMPLE PAGES FOR UTILITY RELOCATION REFERENCE MANUAL



Activity:
Install and splice 100 linear feet of buried fiber cable.

Lowest Duration: 2 days
Average Duration: 3 days
Highest Duration: 5 days

Factors that Influence Productivity:
special conduit cut-over, ground conditions

Activity:
Install one new 2-inch gas line per 50 linear feet.

Lowest Duration: 0.5 days
Average Duration: 1 day
Highest Duration: 2 days

Factors that Influence Productivity:
Site conditions, open trench, plastic (Note: This requires tap and service cut over.)

Activity:
Relocate one pole for 12.47 kV line.

Lowest Duration: 1 day
Average Duration: 2 days
Highest Duration: 5 days

Factors that Influence Productivity:
Crew availability, truck access, pole mounted equipment, amount of outage or MOT coordination required, type of pole