

FIRM PRICE TREE TRIMMING AT JERSEY CENTRAL POWER AND LIGHT¹

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Abstract. Despite high population density and plethora of shade tree regulating agencies, JCP&L has found the use of firm price distribution tree trimming to be more cost effective, provides consistently more clearance than time and material jobs, while still maintaining quality work.

Jersey Central Power and Light's service area represents 43% of the state (3,256 sq. mi.), and we have in excess of 800,000 customers. Geographically we are situated in the northern and south central portion of the state, between Philadelphia and New York City. The terrain varies from coastal pine lands to upland oak-hickory forests. Our customer density is 632/sq. mi. as compared to the state as a whole at 923/sq. mi. Due to the population density which results in significant public concern for trees, we must deal with either a shade tree commission, committee or department in most municipalities and counties that we serve. We must also deal with the N.J. Department of Transportation in trimming trees on state highways.

JCP&L's first venture into firm price tree trimming was in 1984. This came about as a result of reviewing other utilities' firm price programs as well as a desire by management to increase the competitive awarding of tree trimming contracts by a means other than the traditional time and material method. That first year we bid 298 miles on firm price as compared to 1,696 miles on time & material. This represented 12% of the distribution budget in 1984. Year end analysis showed firm price to average \$1842/mi. and T&M \$2,331/mi., for a 26.5% difference. Each year since 1984 the percentage of distribution budget dedicated to firm price has increased (Table A.) In 1987, we are trimming 1,496 miles at a cost of \$3,414,000 which represents 60% of the distribution budget. The gradual shift from T&M to firm price was deliberate on our part. This allowed us to work the bugs out of the program before committing to this new concept. It also allowed

the contractors a grace period to adjust to submitting bids on a firm price basis.

Our firm price consists of soliciting bids on a lump sum basis. Bids cover everything within a defined area, usually a circuit. It may also include several circuits grouped together or a defined geographic area. All conductors within the bid unit (usually circuit) are to be trimmed in their entirety, to include primary and secondary conductors. House loops (service drops) are not trimmed unless a severe tree condition exists. All primary is trimmed in accordance with a set Clearance Guideline (Table B) and is performed using the lateral or natural pruning method. In addition all overhanging limbs are removed. We also have a ground line clause that requires removal, **where permissible**, trees that have grown to within the 8 feet clearance standard (under conductor). The ground line provision is aimed at undesirable trees under the conductors primarily in non-residential areas. The scope of the ground line clearance is defined as the removal of designated tree(s) within a minimum horizontal distance of 6 feet from the outermost conductor or pole or to the original old tree edge, whichever provides the greater clearance. Ground line clearing is required in all areas where the conductors are inaccessible by vehicle. In these areas, ground line clearing consists of the removal of all tree species in the designated clearance zone. Any tree(s) 16" dbh and greater that are to be removed are billed at the appropriate unit price that was submitted with the lump sum bid. These trees must first be approved by the company forester and usually consist of danger trees that fall outside the ground line zone.

The forestry section works very closely with the purchasing department in preparing and managing the firm price work. Forestry supplies an approved list of contractors to the purchasing department. Only contractors with previous utility experience are considered. The approved contractors are re-

1. Presented at the annual conference of the International Society of Arboriculture in Keystone, Colorado in August 1987

quired to attend the one pre-bid meeting held each year. At the pre-bid meeting the specifications are reviewed. We also review pruning standards, clearance requirements, safety, procedures for dealing with shade tree commissions, as well as N.J. DOT Highway trimming permit requirements. Representatives from the purchasing department as well as the forestry staff are in at-

tendance. The circuit maps are handed out and any pertinent information on a specific circuit(s) is reviewed by the appropriate company forester. No field meeting or site tours are held unless required by JCP&L or specifically requested by the contractors to review a particular problem on a job. Along with the circuit maps, the contractors are provided with an approximate mileage figure

TABLE A

JERSEY CENTRAL POWER & LIGHT COMPANY

DISTRIBUTION TREE TRIMMING SUMMARY

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987*</u>
Total Overhead Miles	13,622	13,742	13,781	13,834	13,912	14,066	14,175	14,316
Total Miles Maintained	207	588	1,496	1,718	2,020	1,907	1,908	2,456*
% Complete	2%	4%	11%	13%	15%	14%	13%	17%*
Year Cycle	65	23	9	8	7	7	7	6*
Actual Expenditure Total	916,600	1,808,185	2,660,649	3,725,700	4,501,645	5,446,528	4,320,703	5,714,707*
Time and Material								
\$	916,600	1,808,185	2,660,649	3,725,700	3,952,812	4,181,458	3,499,819	2,300,000*
%	100%	100%	100%	100%	88%	77%	81%	40%
Miles	207	588	1,496	1,718	1,696	1,617	1,382	960
Fixed Price								
\$	--	--	--	--	548,833	1,265,010	820,884	3,414,707
%	--	--	--	--	12%	23%	19%	60%
Miles	--	--	--	--	298	542	526	1,496
Cost Per Mile								
Time and Material	4,428	3,075	1,779	2,169	2,331	2,586	2,532	2,396*
Firm Price	--	--	--	--	1,842	2,334	1,561	2,290
\$/Tree Trimmed								
Time and Material	13.35	15.63	14.65	13.77	14.48	15.46	15.26	--
Firm Price	--	--	--	--	10.48	15.04	10.89	--
\$/Tree Removed								
Time and Material	51.74	25.21	19.55	22.85	17.62	22.70	14.62	--
Firm Price	--	--	--	--	19.70	7.24	16.54	--

* Estimated

for each circuit as well as all Request For Proposal (RFP) documents as required by purchasing. The technical specification is a separate document that is part of this package. (Table C provides a summary of JCP&L's firm price program).

In general, they are given one week for every hundred miles of circuit to review the work. The sealed bids are then returned to purchasing, where an evaluation is made. Lowest price (70%) and technical evaluation (30%), are the factors considered in making an award.

The technical evaluation is conducted by the JCP&L forester after each circuit is completed. The evaluation takes into consideration factors such as: tree clearance attained; quality of work performed; customer relations (number of complaints, resolution of claims/complaints); job requirements such as accurate, legible and timely document submittal; and job completed on schedule.

The contractors performing firm price are given

as much freedom as possible. Such factors as hours of work, number of days worked per week, work on holidays, crew staffing level and equipment type are left to the discretion of the contractor. By so doing, the contractor can maximize his total labor and equipment force to his best advantage to complete the job in the most cost effective manner. Under firm price, it is amazing the innovations the contractors develop to foster increased productivity. These innovations permit the contractor's personnel to operate under conditions that if existed on a time material basis would be considered impossible operating conditions. Profit is a strong motivator.

Contractors are permitted to bill on a monthly basis for all work that has been inspected and approved by the company forester(s). The foresters check for desired clearance on trimming, tree removal where applicable (ground line clearing), and clean up of work area. Contractors are paid based on miles approved times an average cost

Table B. Clearance guidelines

<i>Type Construction</i>	<i>Sides</i>	<i>Over</i>	<i>Under</i>	<i>Exceptions/Remarks</i>
Open wire & cable				
1. 3 Phase, 2 Phase and Single Phase, distribution and distribution spacer cable and transmission cable	6'	12'	8'	Where removal of limb(s) or main leader(s) will seriously disfigure the tree(s), every effort is to be made to get permission to have the tree(s) removed. If permission for removal is not granted, owner shall be made aware of the disfigurement that will result from trimming before proceeding.
2. Secondaries and Street Light Conductors	2'	4'	4'	Exception above applies.
3. Transmission 34.5kV	8'	15'	8'	Remove all overhangs where possible. Exception above applies.
Service drop				
4. Service Drops (Last pole to meter) and neutral when under primary				If a condition exists wherein tree growth has resulted in a condition which could cause damage to Company or customer, the crew shall notify the appropriate Company personnel.

per mile. The average cost per mile is established by dividing the total lump sum bid by the estimated mileage of the particular circuit/job. The contractors are responsible for submitting weekly crew time sheets on the work performed. These time sheets reflect man hours, equipment hours, number of trees trimmed, number of trees removed, acres cut and mileage trimmed, recorded as number of 50' units. The data from these time sheets are used to maintain company records pertaining to tree trimming from which various computer generated programs are available. Approximately 10% of lump cost for the job is retained and paid upon completion of the project after final inspection by the company forester.

Firm price tree trimming has many virtues that make it a desirable method of contracting that provides the maximum amount of miles trimmed for the lowest cost possible. The strengths include: A) No longer concerned with crew(s)/contractors production. Can now focus on quality rather than quantity. The burden of productivity is on the contractor. B) No longer a need to monitor/supervise crews as to hours worked (i.e. starting time, meal time, quitting time, breaks, etc.). *(T&M tree trimming at JCP&L is the responsibility of the operating/line department. Forestry has responsibility for firm price. As a result of the increase in firm price work, the line/operating personnel are free to concentrate on line work.)* C) It is more cost effective. Based on an average cost per mile, from 1984 to 1987, firm price was 10-15% cheaper. Firm price has allowed more miles to be accomplished for the same dollar expenditure. Table A shows the detail of our firm price and T&M experience. D) Work is performed on a complete circuit basis. When complete, all facilities on the circuit will have been cleared. Eliminates spot trimming or partial circuit trimming which allows JCP&L to achieve our desired cycle sooner.

After four years of firm price experience, we found there are still areas that need improvement. These areas are: A) Our present specification for ground line clearing leaves much room for interpretation by contractors as to how much ground line work they can actually be able to get permission to perform. To cover themselves, a contingency cost is added which tends to artificially

push bid prices higher. B) The bid package must be sent out and awards made as early as possible. JCP&L has been weak in this area in the past, but, we anticipate contracts for 1988 will be awarded in December of 1987. Earlier bids and awards provide for more competition at a time when the contractors' labor force and equipment are still uncommitted for the coming year. C) A penalty clause for non-compliance with a completion date that has teeth and is enforceable is required. Must be done by the purchasing/contracts department. D) Because work load is shifted from the line department to forestry, more foresters may be required to manage the firm price tree work. Requirements depend on how many miles are being done in any given year. If the forestry staff is spread too thinly, inspection of completed work may be less thorough. E) By having a large segment of the budget being reserved for firm price and implemented in phases, it becomes an easy source of funds when dollars are needed in other areas or a budget cut back is required. Tree trimming budgets have always been subject to budget cuts before other programs. The firm price budget

Table C. Jersey Central Power & Light Company firm price program summary. Bid invitation thru award.

No. of qualified contractors on bid list	13
Contractors performing work in 1987	8
Contractor rating system	Yes
Pre bid conference	Required
Bid meeting site tour	As Requested
Basic agreement	None - (Separate T&M contract. One Firm contract per successful bidder per round.)
Bid submittal	
Lump Sum	Yes
Price per mile	No
Large diameter danger tree removal	Yes (Over 16" - Paid extra on unit price/dia. basis)
Tree injection	No
Mileage Estimates	Primary Circuit Miles Only
Large diameter tree removals estimate	No
Option to withdraw after bid opening	Yes, if extremely low, given option to withdraw

with its large block of funds makes it an attractive target for budget cutting. We at Jersey Central believe that firm price tree trimming is the correct path to follow.

At this time and under the current firm price and T&M contracts, 65-75% of the total distribution budget dedicated to firm price is the most desirable level for JCP&L. This level allows for the one T&M crew per operating district to handle the day to day trimming requests, emergency calls, as well as performing planned circuit trimming. Each utility company will have to find the T&M - firm price mix that best suits its operating conditions and management philosophy, and corporate goals. By starting slowly and building the percentage of firm price work, we have been able to eliminate major problems before committing significant budget dollars to the program.

Key elements that we feel are a must for a successful, competitive firm price program include: 1) A specification in which the scope of work (clearance requirements) is clearly and concisely defined. Eliminate gray areas that are open to question or varying interpretation. 2) Consistent and uniform enforcement of specification throughout the company. Fair treatment of all contractors throughout the company. 3) A bid list of qualified contractors as large as possible stimulates competition. 4) Solicit bids as early as possible and give the contractors as long as possible to review work. This allows the contractor to plan his work force in advance as well as allow for a thorough review of work to be performed. This has also helped to provide for competitive bids. 5) Define the work area as accurately as possible by providing maps. Eliminates guess

work on part of contractors when reviewing job for bid submittal. 6) Performance Period - Allow contractor entire year to complete job. This allows contractor more flexibility in arranging his work force which usually results in lower bid prices. 7) Let the work hours/days up to the contractor be as flexible as your company will allow. This should include allowing work on weekends/holidays upon notification to the utility. 8) Plan your bid work from year to year and within the year to provide consistent work for contractors. Avoid lapses or gaps between contracts. This will not only help keep costs down but also ensure a skilled work force remains on your property.

No one particular firm price system is best. Each utility company must develop a program—clearance requirements, specifications, contract terms and conditions—to suit their own particular needs or goals. JCP&L has found that by firm price trimming on a complete circuit basis a real cost savings of 10-15% in the cost per mile can be achieved over T&M trimming.

Firm price trimming does work. JCP&L has found it successful even in an area in which we must deal with a high population density and a large number of shade tree commissions. With company supervision being directed toward the quality of work, you can achieve complete circuit trimming, greater clearance and lower your cost per mile.

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