ANALYSIS OF COSTS AND PRICES OF BUILDING REHABILITATION WORK IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA USING IN-HOUSE CONSULTANTS

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Abstract

The paper is a detailed analysis of costs and prices of rehabilitation work carried out on some of the Federal University of Technology, Minna buildings on two of its campuses in the last quarter of 2006. Lecturers of the built-environment faculties were the supervising consultants. The aim was to verify the merits of using in-house consultants in place of the conventional ones. Method used in data collection was historical- collecting from the archives of the Task-force (consultants) and percentages was the analytical tool employed. Figures of savings made for the client by the consultants from both the pre-contract estimates and the various contractors' variation claims were collated and analyzed. It was discovered that savings of between 9 and 43 percents were made on the cost of each of the contracts (lots), culminating in savings of about N9 million. The normal consultancy fee was waived for a flat-rate allowance The further patronage of this type of in-house consultants was recommended for tertiary institutions' infrastructural facilities rehabilitation work.

Keywords: Facility, In-house, Professionals, Rehabilitation, Task-Force, Value-for-money.

Introduction

In the current dispensation world over, where needs for physical structures development outweighs the budget allocation of government to its various organs, parastatals, departments, ministries, managers of such organs look for the best way to optimize use of the limited fund. Thus where a developer wishes to provide modern accommodation and a suitable existing building is available in the right location, it is likely that refurbishment and re-use of the building may well be a more viable means of providing the accommodation than opting for new construction (Gorse and Highfield, 2009). Another merit of refurbishment option, apart from cost saving, is the shorter period for development. Thus this economic advantage of time and cost saving makes the refurbishment option a preferred choice for developers more especially if the buildings are still structurally sound.

By definition, a consultant is a professional in a specific field who provides expert advice based on his or her wide knowledge of the subject matter (Wikipedia; Tordoir, 1995).

Facility Maintenance

Facilities are known to be the largest single class of assets on the balance sheet of a nation (Hamer,1988; Ameh and Oko, 2002). Maintenance can be defined as a combination of any actions carried out to retain an item in or restore it to an acceptable condition (Lee, 1981; ICE, 1983; Davis, 1986, Lee; 1987). Maintenance, be it periodic, preventive or routine serves the primary purpose of preventing the premature failure of the facility and restoring it to its initial status or at least to a level comparable to its initial condition. (Bokinni, 2006). It is however appreciated that a gap continues to emerge throughout the life of the facility due to some legally or environmentally imposed factors or due to what Salihijo (1998) termed the dynamism of user expectations and changes in internal organization. The merits of well maintained facilities are innumerable, majorly among these are, as Doherty (2009) opined; (a) the creation of right impression, (b) improvement in employee efficiency and (c) reduction in operational costs. Maintenance

management can be regarded as the main thrust of facility management as adopted in the Nigerian context (Opaluwa, 2002).

Under normal condition, the main concern of the chief executive of any (public) institution, regarding the state of habitability of the facilities under his/her domain, is to achieve sustainable rehabilitation and maintenance of such assets and at optimum costs. This research is aimed at investigating into the relevance or otherwise of engaging the construction professionals who are in the academy in pre- and post-contract consultancy services. It is also to showcase whether the University was going on a profit making venture or not and to verify the magnitude of profit or loss being incurred by such ventures. The study was prompted by the fact that the idea of using the services of relevant academic staff as consultant to administer the renovation contracts was novel to that University. The only known system that had been in use by the University was the use of private sector consultants appointed through the Federal Government's "Due Process".

Background To The F.U.T. Minna Building Rehabilitation Work

By the end of September 2006, the Vice Chancellor of the University came out with priced bills of quantities for several of the buildings in the initial phase, packaged into sixteen contracts (called lots). While each of the lots for the male hostels contained a building, female hostels had two buildings per lot, and the remaining lots had varying numbers of buildings (2 to 7 buildings) per lot. The pre-contract documentation was carried out by the Works and Services department of the University. The main documents of the contract included mainly the priced bills of quantities (BOQ) with provision for contingency allowances of 10% of the sum and 5% for preliminaries. Profit and overhead were inbuilt into the items of work.

A task-force group (in-house consultants) was raised by the university authority to work as the resident post contract consultants who were to monitor the progress of the work on daily basis including the weekends. This group consisted of academic staff one each from Architecture, Electrical/Mechanical and Civil Engineering and Quantity Surveying disciplines. The team composition cut across gender barriers. The team was headed by a Civil Engineer. Moreover the staff of Works and Services Department of the University served as the pre-contract consultants.

Contractor selection process was carried out by another organ of the University- the Management. It was a variant of fixed price contract arrangement subject to re-measurement of quantities of work done.

The contracts were each to last a period of eight weeks. There was no advance (mobilization) payment to the contactors. Each contract was to have only one valuation payment and this was at 100% (practical) completion of the job.

The veracity of site visits carried out by the consultants at the post contract stage was virtually equivalent to resident supervision. The task force group was given power to order additional work (variation) within the amount of the contingency sum provision.

Method

Oral narrations by the representative of the Director of Works and Services Department on the physical state of the University buildings revealed that by 2006. Most of the buildings of the University, especially on the Bosso campus had been in use for well over 14 years and without any organized, routine maintenance interventions carried out on them. A few of the buildings that were affected by one intervention programme or other such as the Education Trust Fund (ETF) programme did not experience an 'all encompassing' repairs. This type of complete overhauling of the defective elements is regarded as the best among the various types of maintenance methods (Cruzan, 2009).

Records of the pre- and post-contract arrangements for the renovation work were sought for and obtained from the Physical Planning and Development Unit (PPDU) of the University.

On the Gidan Kwano campus of the university record showed that the two buildings (male hostels) which form part of the subject of this paper had been built complete and remained unoccupied for ten years (1994-2003). The first set of the human occupants of the two hostels moved in during the 2003/2004 academic year after an extensive fumigation work. The state of these old buildings on both campuses could be described as, at 2006, deplorable.

The records further showed that the renovation/rehabilitation works were carried out in 2006/2007 academic year employing the services of the in-house consultants.

Information on the Lots, figures of award, actual work done, additional work ordered on each lot was obtained from the post contract administrators of the projects (the Taskforce team). The data obtained were tabulated and the savings made on the lots were analyzed using percentages to verify the type of relationships, if any, that might exist among the variables, specifically between the amount of the original contract sum and those of the actual work measured at completion on the one hand and between the amounts of variation claims submitted by the contractors and those approved by the Taskforce on the other hand.

Finding/Discussion

An informal interview with the Vice Chancellor on his reason for adopting the in-house consultancy option revealed that he desired that lecturers in the Built Environment disciplines use the field experience on current 'live' projects to impart up-to-date knowledge in the classrooms. It was further discovered that the affected lecturers had to reschedule whichever of their lectures that coincided with the site visits.

Table 1 presented the raw data as obtained from the Taskforce team. The original bill of quantities (BOQ) presented all items requiring renovation as at the date of its (BOQ's) preparation The Taskforce team said it based its recommendations for payments on the actual work done. This formed the basis for the differences in the figures of columns 2 and 4 of Table 1.

Due to the fairly long time between the bill preparation date and the date of taking possession of the sites by the contractors, quite notable differences had taken place in the state of disrepair of the facilities. Some of the buildings required more items than were in the BOQ while some required less. Consequently, there were other obvious necessary items for repair which the BOQ did not include.

The Taskforce team instructed the contractors to carry out such specified items of renovation as additional work whose total costs were mostly within the contingency sums provided for in each lot. The contractors' submissions for the price of the extra work and the sums approved by the taskforce are respectively presented in columns 3 and 5 of Table 1.
Table 2 presents the figures of the work as originally envisaged by the BOQ (column b) side by side with the 'as-built figures' (column c). The differences, as shown in column d, were very minimal. Except in the cases of lots 4 and 7 where the differences were more than twenty percent each, all other lots experienced a difference of less than fifteen percent. This is normal, considering the nature of the work involved – renovation work.

The case of lot 11 was uniquely different in that it was a case of under-measurement at the pre-contract stage. The under-measurement was to the tune of eighty-nine thousand naira which amounted to 8.63 per cent.

Table 3 consists of variation figures for each lot as presented by the contractors (column b) followed by the figures approved by the in-house consultants (column c). Columns d and e of the table present the descriptive statistics of the previous two columns. From Table 3, it could be seen that while the entire claims put forward by the contractor for Lot No. 8 were approved by the consultants, about 92 per cent of the claims presented by the contractor for Lot 16 (N1,610,290 out of N1,751,400) were regarded frivolous by the committee and therefore rejected. Thus savings made from the claims of the sixteen contractors ranged between zero and ninety-two percent. Generally, the claims presented by the contractor were far out of proportion when compared with what the in-house consultant team finally approved (which was based on the actual extra work done by each of the contractors).

Table 4 is the analysis of the total sum the contractor would have claimed -original BOQ figure plus the contractor's figure for additional work (column b) and actual work done as per the BOQ plus the approved additional work (column c). The difference between columns b and c produced column d which is the savings (if positive) made for the employer by the Taskforce team. The savings were converted to percentages of the work done (column e).

It could be seen from Table 4 that savings made for the University on each of the lots ranged between about 5% and 43% of the work done. The highest figure of savings was achieved on lot No.16 which is N1 615 500 (41.1%) while the lot with the highest percentage savings of 43% is lot No.7 with the savings on the lot amounting to N856 887. The total savings amounted to N8 910 507 which gave an average savings of N556, 906.70 per lot. This interprets to mean that if the taskforce had not been engaged, the University would have lost at least that total amount of N8 910 507 to the contractors. This total savings of N8 910 507 made on the 16 lots put together was a landmark achievement that the Taskforce made for the University. This was especially so, given that the Nigerian nation was generally believed to be bedeviled with "consultants colluding with contractors to defraud the clients". From the analysis above, it could be seen that there was statistically significant difference between the figure of the measured work in the original boq and the figure of the actual work done. Also there was statistically significant difference between the figure of the contractor's claim for additional work and the Taskforce approved figure.

Conclusion

The deliberate separation of pre-contract consultancy from the post-contract consultancy on work of short-time durations (eight weeks) is a novel approach and was observed to have achieved value for the money of the employer. The use of in-house consultants (academic staff) for the post-contract stage of the work helps to reduce the total cost of the project management. If the consultants were drawn from the private sector the chargeable fees would have been imputed as cost to the client and there would have been no savings made for the employer on the lots because the consultants from the private sector would not have done the residence supervision as the in-house consultants did and without extra fee charged. Thirdly, the experience gained on site by these lecturers could easily be plowed back into the classroom to give the students relevant and up-to-date applied knowledge. These renovated buildings as observed by the researcher, are likely to attain optimum utilization during the post-rehabilitation period. This in turns gives justification for the huge resources expended on the buildings.

Recommendations

This type of comprehensive maintenance programme should be carried out at regular intervals not exceeding say, four years to help elongate the life span of the facilities. Moreover a well maintained facility is generally known to have opportunities of optimal operation for capacity utilization that enhances productivity of the user. For instance good and neat classroom is said to enhance good student performances.

The university's yearly budgets should consciously incorporate setting aside fund for the facility maintenance. This reduces the chance of leaving the facilities unmaintained for so many years as was the experience in this case study.

Regular consultancy engagement of construction professionals in the academic departments should be encouraged and intensified to further consolidate the savings from consultancy fees. This regular involvement of lecturers in consultancy in turns helps in impartation of relevant practical knowledge of site happenings on students. It is therefore recommended to other Nigerian universities to emulate the idea of engaging in-house consultants in the university construction or rehabilitation projects.

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Acknowledgement

The author is grateful to the management of Federal University of Technology, Minna, especially the Vice Chancellor, the Directorate of Physical Planning and Development, and the Directorate of Works and Services.

Appendix

Results

Table 1: Renovation Contracts of FUT Minna Buildings Oct – Dec.2006

LOT	BOQ SUM LESS CONTINGENCY	ADDITIONAL WORK (CONTRACTOR'S FIGURE)	WORK DONE PER BOQ	ADDITIONAL WORK (TASK FORCE APPROVED)
	₦	₦	₦	₦
1	2,643,505	483,250	2,351,545	**207,840**
2	2,620,830	498,461	2,440,130	**300,790**
3	4,499,286	703,257	4,356,123	**583,383**
4	4,985,342	679,600	3,961,400	**470,160**
5	2,961,530	517,300	2,944,830	**240,800**
6	2,372,810	350,430	2,089,730	**257,730**
7	2,446,000	400,480	1784,783	**204,820**
8	1,899,425	120,280	1,722,022	**120,280**
9	3,175,356	283,100	2,745,300	**228,190**
10	3,040,440	272,344	2,590,453	**214,490**
11	3,213,330	1,224,510	3,302,454	**330,410**
12	1,762,007	197,150	1,651,367	**142,713**
13	1,937,444	359,375	1,772,892	**148,295**
14	3,413,680	611,550	2,974,020	**389,030**
15	1,964,835	261,030	1,842,470	**146,940**
16	**3,781,740**	**1,751,400**	**3,779,530**	**141,110**

Source: Field survey 2007.

Table 2: Analysis of Differences in Bill Provision for Measured Work and the Actual Work Done

LOT (a)	BOQ SUM LESS CONTINGENCY (₦) (b)	ACTUAL MEASURED WORK AT COMPLETION (₦) (c)	DIFFERENCE (₦) (b) - (c) (d)	AS % (d/b)x100 (e)
1	2,643,505	2,351,545	291,960	**11.04**
2	2,620,830	2,440,130	180,700	**6.89**
3	4,499,286	4,356,126	143,160	**3.18**
4	4,985,342	3,961,400	1,023,942	**20.53**
5	2,961,530	2,944,830	16,700	**0.56**
6	2,372,810	2,089,730	283,080	**11.93**
7	2,446,000	1,784,783	661,217	**27.03**
8	1,899,425	1,722,022	177,403	**9.33**
9	3,175,356	2,745,300	430,056	**13.54**
10	3,040,440	2,590,453	449,987	**14.80**
11	3,213,330	3,302,454	-89,124	**(8.63)**
12	1,762,007	1,651,367	110,640	**6.27**
13	1,937,444	1,772,892	164,552	**8.49**
14	3,413,680	2,974,020	439,660	**12.87**
15	1,964,835	1,842,470	122,365	**6.22**
16	**3,781,740**	**3,779,530**	**2,210**	**0.05**

Source: Field Survey 2007

Table 3: Analysis of Differences in Claims and the Approved Variation

LOT a	CONTRACTORS' VARIATION CLAIMS ₦ B	APPROVED VARIATIONS ₦ c	DIFFERENCE (b)-(c) ₦ d	% SAVED (d/b)x100 ₦ e
1	483,250	207,840	275,410	**56.99**
2	498,461	300,790	197,691	**39.66**
3	703,257	583,383	119,874	**17.63**
4	679,600	470,160	209,440	**30.81**
5	517,300	240,800	276,500	**53.45**
6	350,430	257,730	92,700	**26.45**
7	400,480	204,820	195,660	**48.85**
8	120,280	120,280	0	**0**
9	283,100	228,190	54,910	**19.39**
10	272,344	214,490	57,854	**21.24**
11	1,224,500	330,410	894,090	**73.01**
12	197,150	142,713	54,437	**27.61**
13	359,375	148,295	211,080	**58.73**
14	611,530	380,030	231,500	**37.85**
15	261,030	146,940	114,090	**43.70**
16	**1,751,400**	**141,110**	**1,610,290**	**91.94**

Source: Table 1

Table 4: Analysis of Overall Savings made by the In-House Consultants.

(a) LOT	(b) Contractor's anticipated sum.	(c) Total work done approved.	(d) Amount saved. (Col. 2- 3 Table 2)	(e) Amount saved as % of work
	₦	₦	₦	₦
1	3,126,755	2,559,385	567,370	**22.2**
2	3,119,291	2,740,920	378,371	**13.8**
3	5,202,543	4,939,506	263,037	**5.3**
4.	45,664,942	4,431,560	1,233,382	**27.8**
5	3,478,830	3,185,630	293,200	**9.20**
6	2,723,240	2,347,460	375,780	**16.0**
7	2,846,480	1,989,603	856,877	**43.1**
8	2,019,705	1,926,842	92,863	**4.8**
9	3,458,456	2,973,490	484,966	**16.3**
10	3,312,784	2,804,943	507,841	**18.1**
11	4,437,840	3,632,864	804,976	**22.2**
12	1,959,157	1,794,080	165,077	**9.2**
13	2,296,819	1,921,187	375,632	**19.6**
14	4,025,230	3,363,050	662,180	**19.7**
15	2,225,865	1,989,410	236,455	**11.9**
16	5,533,140	3,920,640	1,612,500	**41.1**
	Total:		**8,910 507**	