Applied Mechanics and Materials Vols. 635-637 (2014) pp 1926-1930
Online available since 2014/Sep/19 at www.scientific.net

doi:10.4028/www.scientific.net/AMM.635-637.1926

Submitted: 17.07.2014
Accepted: 26.07.2014

Improving the flow of information from the bidding process for public works aimed at achieving LEED certification

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Keywords: Public Works, bidding, environmental certification, LEED, UF

Abstract. This work aims to improve the information flow diagram of the bidding process of a work in progress of an University Federal (UF) from Brazil aimed at obtaining environmental LEED certification. The research was divided into two parts, the first a review of literature regarding the LEED certification was made and in the second part of field research was conducted in the site of UF. The conclusion of study indicates that the government is able to make buildings with more sustainable criteria, even the systems of environmental certification. However, the main intervention must come from changing interest by managers of UF and especially their awareness regarding the importance of the subject.

Introduction

The construction building in Brazil is in the best times in recent years according to the Construction Sector Study 2011 [1]. The government is also making big investments and policy incentives to construct, for example, it can mention the works of the Growth Acceleration Program - PAG, the reduction of taxes of forty-one inputs, including cement and steel and the Restructuring Plan.
To initiate a bidding process is necessary to establish the basic project that refers to a set of elements that should have high level of precision to define and characterize the object of bidding; should be prepared to preliminary feasibility studies in order to avoid environmental impacts and be enable the evaluation of the cost of the work, as well as defining their methods of implementation and the duration of the project [2].The basic project consists of Architectural Projects, Structural and Foundations, Hydraulic, Electrical; Detailed Budget, Schedule Physical Financial and Technical Specifications (Memories Descriptive and Tender Specifications) [2]. The absence of technical descriptions is very evident in all states of Brazil, and there is a national standard, where each agency develops its knowledge according to the staff, especially in the case of works aimed at environmental certification. Therefore, the importance of proper management of the bidding process as a whole, with all technical documents well prepared, incorporating all information, also from different sectors as key to building inspection element.

Leadership in Energy and Environmental Design - LEED

LEED was established in 1999 in the United States by the United States Green Building Council (USGBC), in order to motivate and accelerate the development of sustainable buildings, by establishing performance criteria and is today the environmental certification system more widespread in world [3]. The international LEED has seven dimensions to be evaluated in buildings. All of them have prerequisites (mandatory practices) and credits, recommendations that when met ensure the building points. The level of certification is defined as the amount of points acquired, ranging from 40 points to 110 points level certificate, platinum level [3]. To obtain the LEED certification, the sustainable aspects are assessed using a standard checklist, which addresses all the requirements of different categories. Each item assessed are awarded points which when added together must reach pre-determined levels to obtain certification in different classification

levels, as well as: LEED Platinum: 80-110 points; LEED Gold: 60-79 points; LEED Silver: 50-59 points e Certified: 40-49 points. Importantly, LEED certification is based requirements for deriving principles of the standards and recommendations of U.S. agencies with recognized credibility, like as ASHRAE (American Society of Heating, Refrigerating and Air conditioning Engineers), ASTM (American Society for Testing and Materials), EPA (U.S. Environmental Protection Agency) and the DOE (U.S. Department of Energy), to stimulate strategies for sustainability [4].

Method

The methodology applied in the research was organized two parts: Literature Review and Exploratory visit, team meeting, data collection, flow analysis and drafting new flow.
In order to understand more about the LEED certification process, a literature search was performed in the first moment of the work. As before, the search began for a more practical stage where views were held in the building UF and meetings with those responsibles for collecting information about the work. Then the current flow and the study were redesigned.

Current flow Bid of UF

The current routine bidding process UF is the following the Fig. 1. Making an initial analysis of the data it is noticed that the bidding process works is lengthy and impairs alertness and implement immediate actions both to include new steps and procedures in the bidding and the technical criteria for proper management of works with sustainable requirements.
The stages of the bidding process are as follows:
• Preparation of Bidding Documents: The tender document is prepared based on the requirements required by the public agency, there are described all the features of the service being purchased. In the case of public works, there are attachments of the announcement are the following documents: Form of Contract, Model Financial Contribution Statement - Contractual Warranty, Model Notifiable Model of Technical Activity Statement, Form of Letter of Proposal Submission prices, Basic Design, Architectural Projects and Occupational Memorial Descriptive Model of quantitative Budget Worksheet (with unit price composition) and Financial Schedule Physical Model Sheet. The basic project is one of the most important documents, where the technical requirements are fixed.
• Analysis of Qualification Documents: Enabling the analysis of the bidder must demonstrate that it has the means to participate in the bidding through financial verification (verifying whether the financial support of the company is as required in call); tax (checked if the bidder is in compliance with tax obligations, taxes); labor (verified if the bidder is in compliance with labor obligations); techniques (verified the technical assets of the company is as required in the bid documents and basic design).
• Enable Motion Analysis: The bidders which are classified as compliant by the analysis of qualification documents will open their proposals. These Proposals will be reviewed to check prices of budget spreadsheet of companies, in order to avoid "sheet game".
• Rate: the company that has the lowest price will be rated for the execution of work.
• Approval: checked if the bidding process occurred correctly in accordance with the law and is approved by the competent authority.
• Award: at this stage of the bidding process, the object is delivered to the winning bidder.
• Cancellation, revocation and co-validation: the cancellation can occur both administratively and in the judiciary, it should be largely substantiated by the body which annul. Revocation can only occur in the administrative proceedings where the administrative act is perfectly valid for reasons of public interest due to supervening fact. The co-validation occurs when the vices of illegal acts can be remedied.

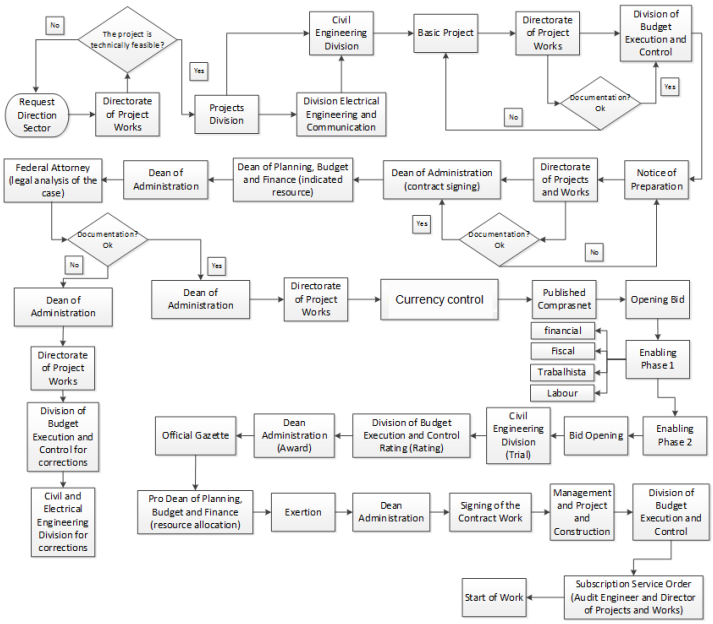

Fig. 1 – Flow chart of current process of applying for work

Case Study

The case study is one of the universities in the state of Paraná that currently has several works in progress, including the case study of this work that seeks LEED environmental certification. The highest authority of the UF is the Rector and Vice-Rector, there are hierarchically below the following Pro Rectors supporting the Rectory: Dean of Administration; Dean of Student Affairs; Dean of Extension and Culture; Dean of Personnel Management; Dean of Research and Graduate Studies; Dean of Planning, Budget and Finance. It was noticed that the amount of services within the Directorate of Projects and Works were bulky, and required a high attention of professionals as they relate to thorough reasoning services and creation.

Bid improved flow

The demand for services arriving daily for the Director are excessive, and this even if the distribution of these effects for each employee, who thinks he is fit for the best and proper execution of the service. With this, the following are suggested interference (based on the administrative structure construction management case study) for each Division (responsible for assembling the bidding process. As previously mentioned, changing the figure of the Director, the high amount of assignments, for it has changed the organizational structure of the Board for a higher level of Dean, in order to decentralize the activities would be required as well as distribute them a better way to promote the activities of the existing bureaucratic flowchart (As legislation – Fig. 1). For this, each existing division obtained a board level in order to provide greater autonomy to each. Moreover, the figure of the Director became stronger hierarchically, in other words a Provost in order to facilitate contact with the needs and demands of the Rectory and other Deans, streamlining the process. The divisions also had their well distributed activities, according to Table 1.

Table 1 – Division of labor and responsibilities

Division	Responsibilities
Director of Projects	Will be responsible for preparing all the work projects, as well as descriptive memorials and other technical documents. Also be responsible, by aggregating all documentation and preparing the document for basic routing of the work for bidding project. Decide together with the client for the project to check the users' needs IFE. This board will be composed primarily of Architects, Civil Engineers, Electrical and Mechanical;
Diretoria de Engenharia Civil	The division is responsible for preparing budgets and budgets bid conference. Have the division of works, be responsible for the daily supervision of works, verification and release of measurements; and also for any emergencies within the IFE existing buildings that are under warranty the work (5 years). This board will be composed primarily of Civil Engineers;
Of Electrical Engineering and Telecommunications Division	The division is responsible for preparing budgets, as well as the conference bid estimates. Have the division of works, be responsible for the daily supervision of works, verification and release of measurements; and also for any emergencies within the IFE existing buildings that are under warranty the work (5 years). This board is mainly composed of Electrical Engineers and Mechanics;
Safety, Health and Environmental Management Division	The Division of Environmental Management is responsible for all matters related to waste management works and campuses, as well as permits and licenses required. Have the Division of Occupational Safety and Health is responsible for the health of this Dean servers, as well as the safety of their work and the tendered works. This board is mainly composed of Doctors, Engineers Safety, Environmental Biologists and Engineers;
Maintenance Division	The division of purchasing materials responsible for the supply of all maintenance required to regarding the necessary immediate repairs and any emergencies, as well as technical documentation for referral to bidding materials. Have the division of performing maintenance shall be responsible for the effective execution of repair works. This board will be composed primarily of Architects, Civil Engineers, Electrical and Mechanical;
Enforcement Division and Budget Control	Responsible for drafting public notices and public works contracts, as well as payments of measurements of works released by the inspectors. Is also responsible for all the financial part of the Board, as well as daily, tickets, etc.. In addition, there will be in conjunction with the divisions the legal sphere in order to bring any action in procurement and other matters required for this Dean. This board will be composed primarily of Managers, Accountants and Lawyers.

With the decentralization of activities proposed new flowchart is shown in Fig. 2 is possible to see that compared with the existing flowchart of figure the removal of the Director will provide greater autonomy to divisions that now acquired a board level occurred. Thus, it is believed that the bureaucratic problems in the bidding process will be partially remedied and provide greater agility and efficiency, in order that the requirements of current legislation were held.

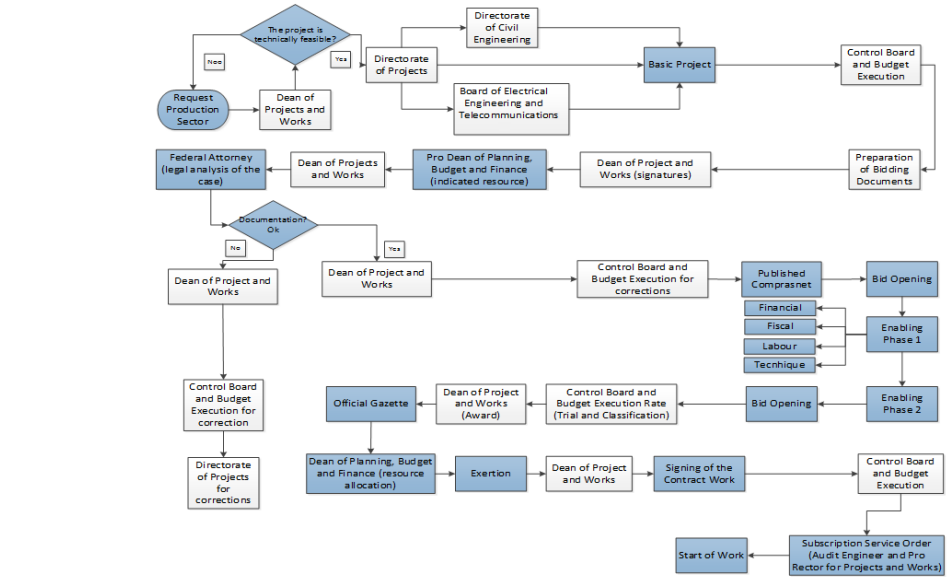

Fig. 2 – Proposed new flowchart

Conclusion

Regarding the case study several problems arising in the implementation phase of the work were identified. However, it can be stated that many of these problems were arising from the absence of technical documents and correct procedures. The law of bidding and government contracts, law n ° 8666/1993 keeps all this bureaucratic procedure. However, they are managers, together with the lack of information that make the bureaucracy as an obstacle. It would be an interesting new model flowchart for the bidding process and the appropriate distribution of tasks, preparation of technical documents well linked with other bureaucratic documents of the bidding process, technical requirements to ensure proper control at the time of inspection of works and projects concerning environmental aspects.

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Advanced Design and Manufacturing Technology IV
10.4028/www.scientific.net/AMM.635-637

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10.4028/www.scientific.net/AMM.635-637.1926