

# Cost Engineering and Compliance Pricing Analysis

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## Abstract

This paper aims to present a methodology for calculating and values for the variables that comprise the BDI as technical and very well justified, for it can't be defined by average not even has maximum percentage to be admitted. It has to be calculated in every work.

## Objective

This paper aims to give readers material for consultation on the methodology to elaborate works budget.

## Methodology

The method of budgeting for civil works so far adopted in our country (Brazil) has its origin in the English language and designed in the United States of America (USA), so some terms still retain their origin, for example, corresponds to the BDI initial term Budget Income Difference. Evidently this term in Brazil was totally misrepresented, however, the methodology of budgeting applied here is very simple. Thus, there was the need to generate its own methodology to Brazil. We must face the BDI in two ways, by a vision of engineering service provider and another by the contracting agency.

## Value

It is necessary and very important to adopt the calculation methodology and values for the variables that comprise the BDI technical and very well justified way, in order to not suffer any reaction from the organs auditors external and internal.

## **Originality**

The engineering schools in Brazil have always had a degree training aiming teaching of engineering techniques, but never bothered with a specialty in the professional field of budgeting in a construction, involving many variables that are implicit in the calculation of formation prices, particularly in calculating the selling price. Therefore, this work contributes to Cost Engineering.

## **Conclusion**

Cost Engineering is a Science and not an art where each professional does whatever he wants. Unfortunately, in Brazil, it is being this way. Therefore, this work contributes to the spread of knowledge of Cost Engineering.

## **Keyword**

*Engineering – Costs – BDI – Compliance Pricing – Price*

## **Cost Engineering and Compliance Pricing Analysis**

Economic globalization transforms the market where every day appear new participants, as partners, customers or competitors, with new concepts, methods, technologies and products. The processes are increasingly dynamic and Concurrent Engineering gradually replaces the Serial Engineering, reflected in costs from the new contractual arrangements, new models and new concessions, shallower organizational structures as well as the formation of consortia and spraying companies.

The Measuring of Knowledge Age acquires new forms, for the new dynamic provided by the Information Technology and Communications, but the information architecture remains.

The market is rapidly changing, increasingly complex, requiring companies to reduce prices, increase quality and accelerate operations and innovate constantly. The corporate response undergoes several transformations, the number of hierarchical levels, lateral expansion of responsibilities with professional performing tasks and functions and not constant revision of strategies, tactics and operational processes. The development of Information and Communications

Technologies (ICT) provides a very important link between business strategy, business process and product engineering. The New Science of Knowledge recognizes that knowledge is constructed, maintained and from information developed through processes of communication and dissemination of information, adding the personal experiences of experts, according to the equations below:

$$\text{Information} = \text{Data} + \text{Context}$$

$$\text{knowledge} = \text{Information} + \text{Experience}$$

Regarding Current Cost Engineering, we have that the selling price of a service engineering is comprised of the following items:

$\text{SALE PRICE} = \text{LABOR} + \text{MATERIALS} + \text{EQUIPMENTS} + \text{LOCAL GOVERNMENT} + \text{BDI}$
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As for Labor, which is an item of high cost and strategic importance, we have to consider than the remuneration of professionals, and other requirements of the law, among other items, we cite the following:

Payroll;

Additional charges (transport, food, Rules of Procedure of Ministry of Labour, life insurance and market) and;

Accommodation, transfer, training and profit sharing.

Currently these costs to construction workers reach up to 300 % of the basic pay of the professional.

As for materials, the challenge of the service provider is greater in view of the high risk involved, due to the determination of the value of the input in the proposal and the natural oscillation of the market until their actual acquisition.

By quoting particular material at the time of preparing the budget, the proposals involve economic risks that are not reduced by the sample size, however, require careful handling to expunge distortions and adopt the most appropriate price. Thus reducing the potential needs of the application for renewal of contract claims to its economic - financial balance, in view of the time limit for its acquisition.

As for equipment, we have to analyze whether they are themselves or others.

If third party, we must admit the same situation for material commented. When you own will fit the company to assess the huge investment required and the need to continually contracting services where these are properly applied. In construction equipment cost is not usually a significant portion.

The cost of Local Administration of the contract is significant mainly by hand factor work and everything that was previously mentioned. Of course raising the selling price. Shall appear in the Bill of Quantities. It involves, among other things, engineers, master work, office staff, storekeeper and property security. Not forgetting support vehicles, capital assets, water bills, electricity and telephone services and consumables.

While the BDI - Budget Income Difference, when applied to the Construction, has calculation methodology that involves the profit margin of the companies, taxes on income and variables defined in percentage, such as the Central Administration, the Insurance, the Contractual and Financial Cost guarantee. The contractor must also consider the risk margin or error.

Indirect Costs = Cost + Insurance + Financial + Central Administration + Contract Guarantee + Error Margin

The Central Administration always uptrend due to the need to invest in new technologies, techniques and exploring innovative business.

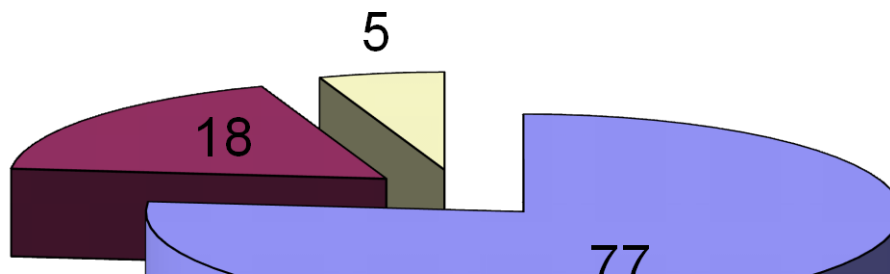
$BDI = Profit + Indirect Costs$

Knowing that BDI is inversely proportional to the value of the contract and has less relation to the type of project, its specific conditions, the period of the work, as well as several intrinsic factors of each work, has no sense to define an average BDI, even sectorial and yes, calculate the BDI contract by contract, in case the service provider.

The contractor will calculate the BDI Reference (or medium for companies who regularly participate in their bids) for each value range of contract.

The Central Administration, in the case of the Contractor, shall be adopted after the establishment of research with the executing companies

## Average BDI Reference - Composition(%)



The Price of a Compliance service is to ensure the application of the parties involved, including relevant Brazilian tax legislation, good technique of Cost Engineering and effective implementation of the project scope.

IBEC 's participation in the Program PROSUB (Submarine Development Program with Nuclear Propulsion) comprising the correct application of these theories, techniques and practices, to run the Cost Management, is engaging, thought-provoking and challenging for the whole team, because besides the great knowledge in Engineering Costs requires all participants should rely on experienced professionals in budget execution and monitoring of works in different disciplines as well as strong familiarity with management of solid enterprises, ensuring compliance services prices listed at Work Breakdown Structure presented in the proposal of the contractor 's, of point of view not only of the applicable law, but also in view of the regulatory authorities and the contractors concerned. As well as ensuring the needs of the performing organization.

The enormous difficulty of Construction requires of Cost Management team constant technical improvement and deeper study of cases occurring in the contract staff.

## Interação dos Agentes na Análise de Conformidade de Preços

