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## engineering

# Caught in the middle: Balancing the role of the engineer within the project team

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In order to better understand how to deal with the owner, architect, owner's representative, construction manager and other consultants on a project, one needs to review the design and construction process. An understanding of the process allows us to evaluate the dynamic relationships involved and to deal effectively with all the design participants.

#### The Team

The owner typically hires the

architect first and his choice is usually based on the architect's experience with similar projects and his willingness to be sympathetic to the particular needs and preferences of the owner. The owner may also engage a project manager or owner's representative who will oversee all aspects of the project but begins by preparing a budget and schedule for the project. Although the architect and project manager both work for the owner, this team organization promotes a healthy adversarial relationship.

The selection of the consulting engineer is generally done by the architect, sometimes with input from the owner. The architect selects someone who can strengthen his team in experience and service and most likely has a historical relation-

ship with the engineer, which gives the architect a sense of confidence in the engineer's expertise and reliability. Recently, there has been an increasing level of involvement by the owner in the selection of the engineer. This is due to the fact that the cost of the work designed by the MEP consultant can range from 25% to 40% of the total cost of construction.

#### Goals

The goal of the architect is to design an aesthetically pleasing environment or structure that also provides for all the needs of the owner. The project managers or construction managers goals are to establish a budget and schedule and to monitor the design and construction to ensure that the project stay within those guidelines. Cost

and time estimates provided by this team member can often dictate the direction of the final design.

The goals of the consulting engineer are to be sensitive to the aesthetic goals of the architect and to coordinate the engineering design with the architectural program while designing MEP systems, which are cost effective, energy efficient and sustainable. However, the most important goal for the engineer is to listen to what the owner wants and to provide a design that is compatible with his preferences and requirements for the space and its uses.

#### Design

It is extremely important that the consulting engineer is involved in the process from the very beginning of the project and meets with the owner as well as the other team

members to establish the design requirements. It is the responsibility of the engineer to offer several design options with their respective costs and ensure that the owner, architect, PM/CM fully understand all the advantages and disadvantages of the various options. To effectively accomplish this, the engineer must ask the owner to specify his priorities with regard to: Maintenance, cost, comfort, energy efficiency and sustainable design. Once the priorities are clear, they are tested during the schematic, design development and construction document phases to see if they have changed and, if so, why. It is not unusual for priorities to shift as a project moves along to completion and cost very often is the final deciding factor.

#### The Balance

The engineer must ensure that the architect has a sense of confidence and trust in him as his consultant. The architect needs to know that you can be relied upon at meetings to give accurate and concise answers to his and the owner's questions. He also needs to know that all MEP trades are effectively coordinated and that the space conditions you have established are correct and will provide adequate clearances for the performance and maintenance of the equipment. And, if there are issues, acknowledge and address them as quickly and thoughtfully as possible.

Also, the owner or PM/CM may have strong preferences regarding the systems or equipment they would like to use on the project. The preferences are probably based on prior experiences and are generally less expensive. The engineer has a responsibility to consider these alternative systems objectively. It is also very important for the engineer to establish a dialogue with the PM/CM to make sure that you examine all the options available for your project. If an agreement cannot be reached regarding the direction of the design, the advantages and disadvantages of the options should be thoroughly discussed by all parties. The final decisions should be consistent with the owner's previously noted priorities.

#### Guidelines

My philosophy to maintain the right balance in this complex role is:

- Listen to what the owner wants
- Be sensitive to the aesthetic goals of the architect.
- Understand the tough job the PM/CM has in getting the job done.
- Admit when you do not know the answer or have made a mistake.

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