Editorial

Scope Creep and the Silent Erosion of Profit

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At the risk of raising a few eyebrows, I feel there is a delicate subject that needs to be discussed — the relationship of fee to the scope of work for structural engineering services. (It should be noted that the following discussion does not recommend any specific fees, encourage any form of collective action with regard to fees, seek to minimize competition, or in any other way run counter to the letter or intent of antitrust laws.)

Many factors have influenced the design and construction process over the past 25 years. This includes the increased complexity and continued development of building codes and standards, new and more sophisticated materials, the evolution and parabolic growth of computer technology, and the litigious environment in which we live. Many of these same factors have influenced the profitability of structural engineering firms. However, the most significant factor may well be the ever increasing expectations of the services we are expected to provide without parallel increases in fees.

The scope of work for basic service has traditionally been limited to the design of the primary structural system. In recent years, we have allowed ourselves to be put into a position of having to do more and more with regard to secondary structural elements with little or no consideration for increase in compensation. This is creating a severe strain on the profit margins of our firms, and can mean the difference between the financial success or failure of a project.

Let's examine the definitions for the primary structural system and secondary structural elements. The primary structural system is defined by CASE in the National Practice Guidelines for the Structural Engineer of Record as "*the completed combination of elements which serve to support the building self weight, the applicable live loads, which are based on the occupancy and use of the spaces, and the environmental loads, such as wind, seismic and thermal.*" This is in contrast to secondary structural elements, defined as "*elements that are structurally significant for the function they serve but do not contribute to the strength and stability of the primary structure*".

Structural documents have traditionally reflected the distinction between the primary structural system and secondary structural elements. Beams, columns, slabs and footings and the like have always been part of a complete set of structural documents. However, there was a time when secondary structural elements were nowhere to be found on structural drawings. These elements were designed, detailed and specified by the Architect, also referred to today as the Prime Design Professional. The traditional fees for structural engineering were a reflection of this split of responsibility.

In recent years, this division of responsibility has changed. Structural Engineers are now sometimes faced with contracts which include a description of the scope of work for a project that is almost unlimited. The following is the scope of work taken from an actual contract I recently received:

"Provide complete structural design for the building(s) to comply with all Codes, including foundation systems, building envelope systems, curtain wall and storefront systems, skylights, structural supports for mechanical, electrical and architectural systems, including but not limited to elevators, stairs, floors, walls, ceilings, equipment, lighting and fire protection. Provide structural design of various minor site support elements, including retaining walls, dumpster enclosures and canopies."

The work represented by this description goes significantly beyond the primary structural system. In fact, we find ourselves responsible for anything "structural", including toilet partition supports, light poles and built-in furniture. At the beginning of a project, even the Prime Design Professional often cannot fully describe the scope. It becomes fully developed only as the schematic design is completed — long after contracts are signed and fees are negotiated.

Design codes have certainly increased in complexity in recent years, and Architects are becoming less equipped to deal with these things. This is not intended to be a criticism of Architects — just a fact of life in our world today. Thus the involvement of the structural engineer is necessary. However, if we are going to be required to do these things, due consideration should be given to the fee for our services.

What other business is willing to agree to perform a service for a lump sum fee when the scope of work is un-defined? I can hear the laughter now from the service advisor at the auto repair shop when you take your vehicle in and ask him to do all work necessary to fix the car, regardless of what he/she encounters or how long it takes.

Engineers are generally great technicians, but poor business men. We need to learn that relating lump sum fee proposals to specific scopes of work is an economic necessity. CASE has done some good work on this through the Contracts committee, and has developed scope matrixes for many of the standard contract forms. (*See the example to the right*)

Specific tasks are presented in the form of a menu where they can be either specifically excluded or included. The Matrix can be used as a tool during fee negotiations with a client to demonstrate the relationship between scope and fee. When faced with a request to cut a fee, an effective tactic is to present a scope matrix and ask for a corresponding reduction in scope. The converse is also true — when an element of work is added to the project scope; it is much easier to justify additional fee when there is a detailed scope for Basic Services that has excluded the requested task.

The final decision regarding the scope and fee for a project always comes down to a business decision. Many factors are involved in this decision, including market conditions, workload, and client relationships. However, being aware of client expectations and contract terms is essential. Services for secondary structural elements can become a significant percentage of the work.▪

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Basic Service	Included	Not Included
SCHEMATIC DESIGN PHASE		
1. Attend Meetings		
2. Establish Structural Design Criteria		
3. Prepare Studies of Alternative Structural Systems		
4. Assist in Selection of Structural System		
5. Provide Structural Criteria for Geotechnical Consultant		
6. Assist in Determining Need for Special Studies		

Example of a Scope Matrix