



## EOR Uses Construction Coordination Drawings to Finalize Design

By Dean Brown, S.E.

**D**o Owners, Building Officials, and even Professional Engineers really understand each other's respective roles and responsibilities, especially on the use of deferred submittals? Many of today's engineered designs are not so much linear (i.e., design then build), but cyclic (i.e., iterations of design then build then design then build, etc.).

Let me relate an experience from another project in which my employer was the Construction Manager (agent) for a federal government agency constructing a post-tensioned structure. The project involved not only the post-tensioning system with associated reinforcing steel, but precast wall panels as well. Each of these products were part of the contractor's scope of responsibility. My involvement on the project began basically mid-stream (i.e., after design documents were submitted, and contracts awarded, and construction delays had occurred). For the sake of simplifying this discussion, the Owner and Building Official were one and the same... a government agency. As was typical of all individual projects on this complex, structural engineers used stamps from their respective states (i.e. any of the 50 state seals could be used).

Project documents correctly defined respective roles and responsibilities for each party. The project specifications included language directing the prime contractor to perform "concurrent coordination" of all submittals. The general notes section of the structural drawings indicated that all structural submittals needed to be reviewed by the EOR. Even the *Post-Tensioning Manual* (published by the Post-Tensioning Institute) concurs by stating, "It is essential that details for the tendons, mild steel reinforcement, conduit, ductwork, and other embedment items be reviewed and coordinated by the ... Engineer and General Contractor during preparation of installation drawings. The installation drawings prepared by the different material suppliers may show incompatible or conflicting layouts." The *Manual* goes on to say, "When conflicts arise either during the development of installation or during construction, the tendon layout should govern over other element or

embedment locations unless otherwise indicated by the Engineer of Record."

On the contractor's side, actual practice was far from reality as documents submitted to the owner were staggered. Coordination drawings were never prepared and conflicts were difficult to pinpoint.

The government contributed a misstep also by not contracting with the EOR (as a cost savings measure) for "construction support services." This obviously resulted in limited structural engineering reviews.

Weeks turned into months, each side pointing the finger at the other as to causation for delays. And though all stakeholders eventually met together to get coordination issues worked out, the project ran into cost overruns and a late opening.

Herein lies the main issue regarding deferred submittals; after stamped documents have been given to the owner, is further involvement by the EOR part of "construction support services" or continuance of the original design process? When is final design ... FINAL?

Furthermore, given the differing language of all 50 states on the use of a seal, does one state's stamp provide an EOR better control over deferred submissions than another state's? That is a legal question I am not qualified to answer.

The need for an EOR's involvement during the "construction phase" is absolutely essential. It is this engineer's opinion that it should be a building code mandated requirement. As demonstrated, design issues are not all resolved once the contract documents have been handed over to the owner (or building official). Allowing conditional statements adjacent to the seal better communicates the need for ongoing involvement by the EOR and easily informs the owner, contractor, and building official what stage of completion has been reached. Please refer to my earlier discussions on these issues beginning in the August 2014 issue of *STRUCTURE* magazine.

In his discussion relating engineering failures, the late Paul Munger, Ph.D., P.E. (*30 Years Later – The Kansas City Hyatt Regency Skywalk Collapse* found at [www.asce.org](http://www.asce.org)), emphasizes the need that engineers not relegate their authority to industry trends

or management influences. He emphasizes that there is indeed a difference between an engineer's authority and responsibility. Authority has more to do with the *power to control or give directives*. Building Officials have authority on building projects within their jurisdiction. Responsibility is an *expected duty*. Professional Engineers demonstrate their Responsible Charge (i.e., responsibility) by use of their seal.

If you don't understand the difference between authority and responsibility, just file a complaint of suspected wrongdoing on a Professional Engineer to his/her respective state board and a preliminary investigation may ensue regarding Responsible Charge. File a similar complaint on a building official (if you can determine who regulates them) and you will most likely get a letter deflecting any city or county responsibility. I would argue that Building Officials have authority but little responsibility. The two are not necessarily the same.

More conditional control on the use of the stamp gives more authority to the Professional Engineer and provides better communication on the use of deferred submittals.

In Mr. Hung's article (*STRUCTURE*, December 2003 – January, 2004), he writes, "What are the design phases in a project? What work product is required in each phase of a project? How much information does a structural consultant need for his/her design...on each phase."

Until these questions are clearly defined (i.e., clarifying what Standard of Care actually means), Professional Engineers need to question current industry practices and be determined to improve that which we can have influence on. This author believes the first step is in providing better statute language on the conditions surrounding the use of the seal. ■

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