ADMINISTRATIVE BULLETIN

NO. AB-082

DATE : January 8, 2008

SUBJECT : Permit Processing and Issuance

TITLE : Requirements and Guidelines for Structural Peer Review Procedures

PURPOSE : The purpose of this Bulletin is to provide criteria for the evaluation and permit approval for applications to construct new buildings or alterations involving a substantial increase in the envelope of an existing building or structure requiring peer review for structural integrity. These criteria and evaluation procedures apply to buildings whether designed according to prescriptive code requirements or nonprescriptive (performance-based) methodologies.

REFERENCES : 2007 San Francisco Building Code
- Section 101A.2, Purpose
- Section 104A.2, Powers and Duties of Building Official
- Section 104A.2.8, Alternate for materials, design, tests and methods of construction
- Section 105A.6, Structural Advisory Committee
- Section 403, Special Provisions [High-rise buildings]
- Chapter 16, Structural Design Requirements
- ASCE 7-05, Chapter 17 – Seismic Design Requirements for Seismically Isolated Structures
- ASCE 7-05, Section 17.7 Design Review
- ASCE 7-05, Appendix 11A Quality Assurance Provisions
DISCUSSION :

Peer review is a process that assesses the quality, correctness, and suitability of a submitted design. The peer review can focus on the whole project or any specific area, such as the design criteria, performance objectives, structural design concept, lateral-force-resisting system, code provisions, or any major design issues or design details. Peer review approach may consist of the following:

- **Conceptual Design.** Advise and assist the EOR in the development of conceptual retrofit design and related design parameters (material tests, properties, design criteria) to satisfy their performance requirements and other criteria
- **Detailed Design.** Advise and assist the EOR during the development of analyses, detailed design, and construction documents, as required.

The goal of a peer review is to provide an independent assessment of a building project pertaining to building code issues. With the increasing complexity of building codes, it is becoming more difficult for designers to anticipate the implications of code regulation on a specific project. A relatively small amount of time devoted to assessing major building code issues can often save long delays in re-design and unanticipated building component integration. Key issues such as building height, building floor area, site placement, type of construction and major exiting concepts are reviewed. Occupancy classification and occupant load determination is reviewed. The purpose is in establishing a framework within the design's parameters from which a viable code compliant design can be presented for the building's owner and its occupants. A peer review also helps to assist DBI’s review process by addressing concerns specific to a building code review.

**Administration Guidelines:**

1) Projects requiring for peer review:
   - A) High-rises over 240 ft. using code prescriptive design;
     [Note: A high-rise building has floors used for human occupancy located more than 75 feet above the lowest level of fire department vehicle access. (SFBC 403.1)]
     
   - B) Buildings use nonprescriptive or performance-based design (Alternative Method per Section 104A.2.8);
   - C) Buildings use special design features like: Base Isolation System, Dampers, Buckling Restrainted Bracing System, and other non-conventional seismic resisting structural system;

2) Selection of Members for the “Structural Peer Review Panel” (SPRP)

An SPRP, similar to the Structural Advisory Committee in SFBC Section 105A.6, shall be established to advise the Building Official on matters pertaining to the design and construction of buildings with special features or special design procedures. Upon request by the Building Official, the engineer of record for such a project shall demonstrate to the SPRP how the structural concepts, designs, details, erection methods and quality control will produce a structure that would meet the intent of SFBC Section 101A.2.
Depending on the structural design system of the building, staff of the Department of Building Inspection will develop a list of specialists which would include, but not limited to, Professors from the Universities, practice structural engineers and geotechnical engineers and/or geologists specialized in the seismic ground motion. The list will be provided to the Structural Engineer of Record for selection of the SPRP.

The established SPRP will create independent contract with the EOR/Project Sponsor for their services.

3) Structural Peer Review Scope and Process:

The EOR is responsible to provide all require review material to the SPRP.

The requirements detailed in SFBC 105A.6.3, Report from Structural Advisory Committee, apply to all buildings requiring Structural Peer Review. In this section, SPRP shall submit to the Building Official a written report which shall include professional opinions concerning, but not limited to, the following:

1. The validity and appropriateness of the structural design concepts and criteria.
2. An evaluation of the structural design of the building or structure to determine its capability to perform satisfactorily beyond the elastic stresses stipulated by the code, with sufficient redundancy to accommodate overloads or failures of specific structural components.
3. The constructability of proposed structural details and erection methods.
4. The sufficiency of the proposed inspection, testing and monitoring to be provided prior to and during construction.

Funding for Peer Review/Structural Advisory Committee:

The project sponsor is typically responsible for the payment of hourly fees and other expenses for the professional services of the members of SPRP. In order to allow a peer review to remain independent of the interests of any project sponsor, the project sponsor must place funds sufficient to cover all anticipated payments in a separate account with DBI. DBI will disperse such funds as services are provided and billed. Costs beyond those initially anticipated by a project sponsor must be paid to DBI before permits may be issued.
Design considerations: regulated structural peer review.

By Roberge, Conrad P.
Publication: Buildings
Date: Saturday, April 1 1995
Subject: Construction industry, Structural design (Evaluation), Buildings (Design and construction)
Product: Building Construction

As the trend toward more complex structures and building codes continues, a peer review of a structure's design can help in averting disaster.

On June 19, 1992, mandatory requirements for independent structural engineering review of the design of new structures built in the Commonwealth of Massachusetts became part of the Massachusetts State Building Code (MSBC). The process, known as peer review, applies to the design of all structures over certain threshold limits of size or occupancy. The purpose is to enhance public safety through independent verification that a new structural design appears, to be conceptually correct and free from major errors. Under the MSBC provisions, the prospective "owner" of a new building retains a reviewing structural engineer, independent of the design engineer of record and others on the project team, to conduct an overview of the structural design by checking the building's overall design criteria and the concept of the structural system, and by checking the design of a representative fraction of the structural elements. The review is not intended to be an exhaustive check.

The Commonwealth of Massachusetts is progressive in adopting such requirements for peer review; only one other state - Connecticut - has similar requirements. But the concept of structural peer review is not new. It has been developed and promoted for over 10 years by industry organizations concerned with mitigating the occurrence of life-threatening structural failures. Nationally, support for the adoption of structural peer review is growing rapidly, and other countries have had similar requirements for decades.

Nearly three years after adopting MSBC requirements for structural peer review, many building owners and others (including some structural engineers) still challenge the need for, or the intent of, these requirements. Individual cases have demonstrated that there are many professional and procedural issues to face. And, while meeting the letter of the requirements, a peer review can be ineffective if it is not properly conducted according to the intent of the provisions.

The current process of structural design of buildings in the United States has evolved from simple methods and codes, large factors of safety, straightforward communication among all participants, and clear lines of responsibility, to a complex business producing high-performance structures. Today's structural design involves complicated building codes and design specifications, lower factors of safety, design/construction teams with many parties and unclear lines of responsibility, and often extreme financial and time pressure.

While the incidence of catastrophic, life-threatening failures has been relatively low, a rash of such failures from the late 1970s through the late 1980s suggested something had gone awry. Among the major failures were the following:
Hartford (CT) Civic Center. In January 1978, the roof of the Hartford Civic Center Coliseum collapsed. Fortunately, no one was in the building at the time of the failure, but just a few hours earlier 6,000 persons had been assembled in the building for a sports event. An investigation revealed that a design error involving improper bracing of top chord compression members was the likely cause of the roof collapse.

Harbour Cay Condominium. The Harbour Cay Condominium in Cocoa Beach, FL, collapsed in March 1981 while under construction, killing 11 construction workers. The building had been designed by two retired NASA engineers: One of them, who had performed most of the building's design, had little experience with building design; the other allowed his professional engineering seal to be affixed to the plans even though he was not familiar with the building's design.

Hyatt Regency Walkways. In July 1981, two suspended walkways at the Hyatt Regency Hotel in Kansas City, MO, collapsed, killing 114 people and injuring hundreds of others. Investigations revealed that a critical hanger-rod-to-walkway-beam connection was never structurally designed. Responsibility for the connection was lost in communication between the structural engineer and the fabricator's detailer. Compounding this error was a construction-phase change in the walkways' hanger rod arrangement that essentially doubled the load borne.

L'Ambiance Plaza. In April 1987, the partially completed 16-story L'Ambiance Plaza Apartment building in Bridgeport, CT, collapsed while under construction. Twenty-eight construction workers were killed. While the cause of the failure was never conclusively determined, investigations by many organizations revealed several gross deficiencies in the structural design and construction. These problems were the result of a serious breakdown in communication, the unclear assignment of design responsibility, lack of quality assurance programs, and other safeguards to public safety.

While there are several design and construction quality issues in all of these failures, a common quality step lacking is independent verification of the adequacy of the structural design. In typical United States practice, the assurance of the quality of a structural design rests almost entirely with the engineer of record. There are no regulatory checks as there are in other industries, such as airlines or pharmaceuticals. Many years ago, plan reviews by local building departments often provided thorough reviews of building structural designs and, in some cities like Los Angeles, building departments still provide comprehensive reviews. Generally, however, municipal building departments have neither the staff nor the funds to provide meaningful reviews of today's complex structural designs.

One characteristic of catastrophic building failures is that they tend to be low-frequency, high-consequence events. While they receive great attention when they do occur, they are forgotten by many shortly thereafter, so that high priority on their avoidance is lost. Consequently, building owners and the general public frequently do not value the importance of sound structural engineering.

In an industry where financial competition and time pressures are severe, responsibility is not well-defined, and communications may be unclear, this is a recipe for disaster. The structural engineering profession realizes that it has an obligation to take a stronger role in assuring public safety. That obligation is better served by exercising some form of self-regulation rather than by having such regulation imposed on the profession by others. Peer review can help mitigate these disasters.

After the spate of structural failures from the Hartford Civic Center through the Hyatt Walkways, a number of national conferences were held, attended by experts on structural failure investigation and avoidance. Out of the careful deliberations of these conferences came experts' recommendations for actions needed in the design and construction.
industry to mitigate the chances of catastrophic failure. The similarity among the recommendations that came from each conference is striking. All advanced the need for structural peer review.

However, frequent misunderstandings among building owners and others regarding the purpose of the peer review are common. The peer review:

* is not an exhaustive check of the structural design:

* is not intended to mitigate the occurrence of minor failures or serviceability problems (e.g., excessive vibrations or deflections);

* is not intended to identify potential cost savings in the design;

* does not involve elements of the building other than the principal structural system; and

* is not an opportunity for the building owner to engage the liability insurance of another engineer. There is, however, substantial latitude and judgment for establishing the scope of peer review. Consequently, the thoroughness and effectiveness of the review can vary. Peer reviews by experienced engineers can be very effective and efficient in spotting gross problems - a seasoned eye is invaluable. Wise owners will select a reviewer largely on the basis of experience and qualifications rather than fee.

Disputes may arise in the review process over differences of opinion between the reviewer and the structural engineer of record regarding the adequacy of one or more particular elements of the design. If the reviewer and the engineer of record cannot come to an agreement within this framework, the owner may direct that the more conservative opinion be adopted, or the owner may engage a third party.

Technical qualifications and experience are not the only important qualifications of a peer reviewer; also paramount are high standards of professionalism and skill in resolving disputes. From an owner's perspective, perhaps the greatest risk that peer review presents to the project is the possibility of a protracted mediation process caused by differences of opinion between the engineer of record and the reviewer. Strong communication skills, a willingness and ability to understand alternative points of view, and a commitment to a successful review process are key qualifications. In selecting a reviewer, an owner should look for an experienced and knowledgeable engineer with a demonstrated record of conducting meaningful and effective reviews.

Peer review is receiving more consideration nationwide as building owners, designers, and code officials recognize that the complexity of current design codes and specifications, the complexity of modern design and construction teams, the use of higher performance structures with lower factors of safety, and the severe business and time pressures of the industry work to increase the probability of catastrophic life-threatening failures.

The experience with peer review in Massachusetts demonstrates that it can be effective in reducing errors in new structural design, but the process poses several challenges in execution. The peer reviewer must be selected not only for technical competence and experience, but also for skills in problem resolution. The scope and timing of the review can be critical to the project's success. Segmented design processes and changes to the design during construction present opportunities for errors to go undetected by the review.

Peer Review Guidelines and Requirements
American Consulting Engineers Council (ACEC)/American Society of Civil Engineers (ASCE). ACEC, Washington, D.C., and its affiliated organization, the Coalition of American Structural Engineers (CASE), have developed several programs and guidelines for peer review. ACEC conducts Organizational Peer Reviews, during which the quality of an engineering firm's professional practice is examined independent of a particular project through a quality audit. CASE has developed a comprehensive set of guidelines for Project Peer Review (CASE Document 5-1992). That document contains not only a comprehensive suggested summary of services for peer reviews, but also provides recommended terms of agreement between the owner and structural engineer for project peer review services. ACEC and ASCE formed a joint task committee to develop a policy and set of proposed guidelines for

* The Massachusetts Requirements. On January 25, 1971, a 16-story apartment building known as 2000 Commonwealth Avenue in Boston collapsed while under construction. Four workers lost their lives. Investigations revealed a number of problems with the design, detailing, and procedures used in the concrete construction. This building's failure prompted a program of project peer review in Boston. The Boston procedure was superseded by the Massachusetts State Building Code (MSBC) requirements in 1992.

The proposal to develop mandatory state-wide requirements for structural design peer review was initialed by the chairperson of the Board of Building Regulations and Standards (BBRS). Concerned over the increasing seriousness of reports of nonconforming seismic design practices in new structural design, the chair brought his concerns to the Boston Association of Structural Engineers (BASE). In considering the chair's request, BASE judged that non-conforming design was a concern for all life safety aspects of structural design, not just earthquake resistance. As a result, BASE developed a comprehensive proposal for peer review, which was first submitted to the BBRS in February 1991. The Boston Society of Civil Engineers Section/ASCE and ACEC acted as BASE's sounding board by commenting on draft versions of the document. The BBRS adopted the BASE recommendations with some modifications, and the requirements for peer review became effective June 19, 1992.

* Requirements in Connecticut. Public Act 89-255, which went into effect July 1, 1989, requires an independent structural engineering review of large structures that exceed an established threshold limit. The Connecticut Engineers in Private Practice has developed guidelines for the reviewing engineer.

* Requirements in Other Countries. In West Germany, "proof engineers" have practiced a form of project peer review for over 50 years. Design reviews by independent proof engineers are mandatory for major structures. The proof engineers are neither building inspectors nor project peer reviewers; they are federally licensed, independent peer consultants who are retained.

In Belgium, the Bureau de Controle pour de la Securite de la Construction en Belgique (SECO) supervises all phases of design and construction. SECO is a non-profit institution organized like an engineering consulting firm, representing all Belgian insurance companies which, in turn, support it financially. When an owner seeks insurance for a proposed building, he or she submits the design to an insurance company. Before the insurance company will write a policy, SECO reviews the design.

France employs a peer review system very similar to Belgium's SECO system.

RELATED ARTICLE: Peer Review of a Hospital Building
This hospital building is a reinforced concrete structure six stories high and approximately 270- by 150-feet in plan. The building employs shear walls for lateral bracing and resistance to wind and earthquake forces. The structure was designed to accommodate three future stories. A number of problems came out of the peer review.

Cantilevered grade beams were required to support 10 levels (nine stories and a roof). The design incorrectly considered the top steel to be fully effective in providing shear reinforcement for the cantilever portion of the grade beam rather than prodding additional uniformly-spaced horizontal reinforcement. The top steel was not fully effective due to the lap splices that were detailed [ILLUSTRATION FOR FIGURE B OMITTED].

The designer’s lateral load distribution to the shear walls was incorrect. The shear walls were designed only for tension forces, neglecting very large compression forces. The shear-wall reinforcement of the original design called for 15 #11 bars with no ties. After correcting the errors, the shear-wall reinforcement was 63 #11 bars with ties [ILLUSTRATION FOR FIGURE A OMITTED].

RELATED ARTICLE: Peer Review of a High School Gymnasium

This case involves a long-span, 1-story-deep truss supporting one classroom level and a roof over a high school gymnasium. Due to an error in computer modeling for the structure’s design, the bases of the column were considered to be freed against rotation. As detailed on design drawings, however, the column bases are pinned. As a result the columns were designed to have only 50 to 70 percent of the required capacity.
APPENDIX B

Independendt Structural Engineering (Peer) Review Required by Code for Larger, More Complex Structures
by Robert Daigle, P.E.
(click here to view this article in PDF format)

What is a Structural Peer Review?
A structural peer review is a review of the structural design of a building by an independent structural engineer for the purpose of verifying that the building proposed for construction is designed in accordance with current Code requirements.

Why Have a Peer Review Done?
The Massachusetts State Building Code requires it for buildings over a certain threshold in size, use or complexity to verify that there were no inadvertent errors made in the design. It is a second opinion with regard to the adequacy of the main backbone of the building. The part that holds the building up against forces such as gravity, wind, snow and earthquake.

Whether required by Code or a requirement of the prospective building owner, it can provide great benefit to the quality of the completed building.

In present time, construction is moving at a rapid pace. Computer software has made structural engineering very competitive. Sometimes critical issues are missed in the structural design, creating the potential for problems. The peer review is a way to put a fuse point in the design process. It gives the owner the opportunity to get a second opinion as to the adequacy of the structural design of their building.

What Buildings Require a Peer Review?
The Massachusetts State Building Code (780 CRM article 110.11) requires that certain structures be peer reviewed. (See excerpt to the right.)

Who Decides When a Peer Review is Required?
It is our opinion that the building official is responsible in deciding if a peer review is required. As a failsafe, our office typically notifies the architect/ owner if their project is subject to a peer review based on our interpretation of the Code. We are also contemplating adding a large stamp on our drawings near the PE seal stating "THIS PROJECT REQUIRES A PEER REVIEW".

We fear that some owners are taking the approach that if the building inspector doesn't ask for one (a PR), they won't volunteer to provide one. They might plead "nolo contendere" (I didn't know it was the required). This amnesia would be difficult to justify on our projects because of the notification we send to the architect/owner when we submit our proposal for services which informs the owner that a peer review is in fact required by Code.

How Do I Measure the Volume for a Peer Review?
According to the MBC article 110.11.1.2, the 400,000 cubic foot volume criteria shall be measured using the outside dimensions of the building which shall include stories below grade. Basically, it's the height x width x length (in feet). Sometimes a quick approximation can be made multiplying the floor area by the average floor to floor height.

Actually, it should be required of the architect to list the building’s volume along with other pertinent information on the project’s title sheet so the Building Official does not have to calculate this value which can be time consuming on larger projects.

Who Pays for This Review?
The owner. The Code stipulates that the owner hire the peer review engineer directly. The purpose of this is to minimize the potential for conflict of interest and insure an impartial review.

Who Should Be Hired to Perform the Peer Review?
The reviewing engineer must be a professional engineer, registered in Massachusetts, qualified by experience and training and who shall have had structural design experience with buildings or structures similar to that covered by the application for the building permit. The reviewing engineer shall be impartial, and shall be independent of the architect of record, structural engineer of record, and contractors and suppliers who will be involved in the construction of the structure.

For building owners who do not know a structural engineer, the architect may provide them with a list of potential peer review engineers. This list is sometimes assembled by the SER (structural engineer of record) for the project. Usually the engineers on this list
are valid non affiliated firms. In some instances however, the engineers on such a list may have performed peer reviews on a number of
the SER's past projects. This might result in some unintended complacency as a result of the peer reviewer's familiarity of the SER's
work. Remember that the Code requires that the peer review be independent of the structural engineer of record.

A proactive method of choosing a peer review engineer would be to contact the building inspector for recommendations as to potential
candidates. These could be combined with the names presented by the architect and a selection could then be made based on quality of
service and objectivity rather than solely on price or familiarity. It should be noted that since the project liability remains on the
shoulders of the SER, some peer reviewers lose some of their edge since there is perceived to be no real liability on their part. Unless of
course a collapse occurs and it can be proven that the PR did not provide due diligence in their review. Do not select a peer review solely
on fee if you want to get a good thorough job. The scope of services is too broad from one bid to another.

Although the governing New Hampshire Building Code doesn't have a peer review requirement, the City of Nashua decided to have their
more complex school buildings, peer reviewed. This was precipitated by a prior roof collapse at one of their buildings.

We commend them on recognizing the importance of the peer review process.

When is this Review to Take Place?
This review is to be conducted prior to issuance of the building permit. To help expedite the construction process, the peer review might
be issued in two stages; one for foundations and the second for the superstructure. However, problems can develop if the peer review is
delayed into construction. If an error is found, it could be costly to correct whereby it could have been flushed out earlier if the review
was done prior to construction. We advocate owners have the peer review completed prior to issuing the drawings for competitive bidding
thus minimizing potentially costly disputes.

What Happens if the Peer Review Process is Overlooked or Delayed Until Construction is Underway?
The potential of high cost correctives become an issue. When a peer review is done on time, the process moves relatively smoothly. In
our opinion, the proper time for the peer review is once the plans are at least 90% complete but no later than when the project is sent
out for bids. That way when a design change is required as a result of the review it can be done quickly and easily before the project hits
the streets.

If the peer review is not done until after construction commences (i.e. building official was not aware of the peer review requirement and
permit was issued), any change resulting from a peer review at this stage will cost somebody money. If the shop drawings are
complete and approved, these documents would have to be revised. If the structural steel is already fabricated, a design change could
require modification to the steel. If the foundations are already installed, footings may have to be removed and replaced. Although the
typical peer review doesn't usually discover major collapse issues, I do know of some horror stories.

What if a Major Change is Made to the Structural System After the Peer Review is Conducted?
Who is responsible for calling for an update to the peer review if a change is made? The Building Official? We have seen an instance when
a peer review was made, only to be trumped by a major change to the primary structural system. No update to the peer review was
required by the building official.

Are Renovation and Alteration Projects Candidates for Peer Reviews?
It is our professional opinion that renovation projects should be candidates for a peer review. There might be extenuating circumstances
that the building inspector should consider while evaluating the minimum criteria for the peer review, as illustrated below:

Case Study:
We worked on a renovation / addition project in Massachusetts where an existing building was significantly increased in size. This project
included a number of components:

a. There was a 7,000 sq. ft. addition added to one side of the building. (~84,000 cu. ft.)

b. Another addition measuring 13,000 sq.ft. was added to the opposite side of the building. (~170,000 cu. ft.)

c. A third smaller addition was added to the rear of the building. (~50,000 cu. ft.)

d. The existing exterior masonry shear walls were removed and replaced with structural steel
moment frames.

e. A large 22,000 pound HVAC unit was added to the roof of the existing buildings.
f. Perimeter additions created increased snow conditions on the existing roof due to drifting and increased fetch.

g. The front gable roof was hollowed out to create an open cathedral type ceiling over the check out area.

It was our opinion that the existing structure was altered and modified enough to require that the volume of the existing building be added to that of the proposed additions, thereby exceeding the 400,000 cubic foot threshold for a peer review. We issued a letter to the architect/owner stating our opinion that a peer review was in order. According to the owner, the building department did not feel that a peer review was required.

**What About Design Delegated Building Components?**

First off, design delegation is the act of the SER passing on the responsibility of certain proprietary construction elements to the manufacturer who can more economically design and specify their particular product. This might include items such as roof trusses, panelized wall systems, steel connections, etc. In such cases the engineer of record also passes the professional responsibility of designing that component to the manufacturer by means of requiring that they have the design advanced by a registered Massachusetts professional engineer.

Now, along comes the peer review. Many of the delegated designs are not completed until after the building permit is issued. Let's look at the following case study to see the problem.

**Case Study:**

Let's say there is a town hall to be built that has a large gathering area which will house over 300 people. The roof over this area is to be constructed using pre-engineered wood trusses. The engineer of record designed all the foundations and interior supports such as beams and columns. The construction plans show all of the structure including the roof trusses, although the design of the roof trusses is not specified. This design is delegated to the truss manufacturer. Now, the project is issued to a peer review engineer and they proceed to review the structural drawings as presented and only check the "performance spec" for the trusses, i.e. required snow/ wind loads, etc., and presto, that is the end of the review. The roof truss design goes unreviewed. One might think that the engineer of record would review the truss design, but this is not the case. In contrary, the engineer of record may not even require any documentation other that truss shop drawings bearing the seal of the design engineer. This is because any representation, real or implied, that the SER is going to review the truss calculations takes on liability for that design and defeats the intent of design delegation.

It is our professional opinion that the peer review on a project like this would have to be issued in two phases: 1) for the foundation, beams and columns; and, 2) for the roof trusses once the truss contract is issued and the truss design is completed. After the truss design is satisfactorily reviewed by the peer review engineer, the final letter of acceptance can be issued completing the peer review process.

SIDE BAR: In the ever increasing pace of construction, the truss industry is becoming highly automated. In doing so, technicians are being placed in charge of running the engineering software for the truss engineer. Many designs are rubber stamped by engineers out-of-state with multiple registrations throughout the country. As the pace quickens and the numbers of projects increase, the reviewing engineer may not have sufficient time to check all of the designs. We've seen some stamped (PE seal) truss shop drawings issued with computer warnings stating that a particular component is "overstressed", without any human eyes seeing this warning let alone the design being adjusted. Design delegation is a necessity for many projects to be completed economically, but such elements must be subjected to the same checks and balance system required for all critical structural assembles. It is therefore important that the peer review check not only the foundation, beams and columns, but also the trusses.

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Hopefully, this article will shed some light on the peer review process and its possible pit falls.

If there are any questions or comments on this article, please contact Bob Daigle. Further input on this subject will be shared via future communications.