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Structural Steel Specifications—Editing and Coordination

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Insights on how to achieve clear and complete communication in construction specifications.

SPECIFICATIONS ARE A NECESSARY EVIL in the life of a structural engineer. In fact, they are required for most projects. As a consulting architectural specifier, I encounter specifications written by many different structural engineering firms. I have found that many need editing and coordination by the structural engineer, the architect, and other consultants in order to create clear, complete, concise, and correct specifications. Moreover, there are some common issues across most specifications, and awareness of these items will make the editing process easier, improveing the overall quality of the project. The following is a compilation that touches on those common issues.

Part 1 – General

The coordination issues below apply to all specifications, not just structural specifications. Because all entities involved in a project want to produce well-coordinated documents, incorporating the following will move the specifications one step closer to this goal.

The first and simplest coordination item is the decision to use MasterFormat 2004 version or MasterFormat 1995 to organize the specifications. Produced by the Construction Specifications Institute, MasterFormat is the numbering system used in the construction industry to organize not only specifications, but also cost estimating, product data, and even architectural libraries. Although most new projects are written with the MasterFormat 2004 version, there are still old master guide specification sections in use based on the MasterFormat 1995 version. An easy way to determine which system is being used is to ask whether 5-digit (MasterFormat 1995) or 6-digit (MasterFormat 2004) specifications are required. Because changing versions of specifications is not accomplished by simply adding a sixth digit to the section number, clarifying which version is to be used before editing begins will save a great deal of editing time down the road.

A second simple coordination item is to determine if the project is working toward LEED (Leadership in Energy and Environmental Design) certification. If LEED certification is being pursued, be sure to ask for the working LEED Scorecard prior to the start of specification editing. From this document, credits to be included in the specifications can be determined. By asking for and incorporating the LEED information at the start of the editing process, overall editing time required can be reduced.

Another easy coordination item is the actual format of the section for each project. Request from the architect, prior to beginning editing of the specifications, the font type and size, margin size, units of measurement, and header/footer information. Most architects will be happy to distribute a sample section indicating the required format.

Finally, a not-so-easily coordinated item is consistent terminology. Coordinated and consistent terminology is a must on the drawings and in the specifications. Many architects and engineers use proprietary terminology on the drawings, when non-proprietary terminology is used in the specifications to describe the same product. Proprietary terminology on the drawings can cause problems for the architect when a minimum of three products are required for publically bid projects. One example of a proprietary product name incorrectly included on drawings is Fire-Trol. Fire-Trol is a brand name of fire-rated prefabricated building columns manufactured by Deal Lally L.P. Indicating Fire-Trol on the drawings does not easily allow for the two other currently available manufacturers to bid on the project. If any assistance is needed to modify proprietary terms to non-proprietary terms, contact the specifier for the correct term.

Part 2 – Products

Individual structural steel specification sections have additional coordination requirements. A number of items are noted below.

Structural Steel Framing—For structural steel framing, the structural engineer will edit for all of the structurally related

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Specifying AESS

Frequently structural steel framing is designed to remain exposed to view after the structure is completed. Especially in high-end structures where appearance is important, engineers and architects may wish to specify closer dimensional tolerances and smoother finish surfaces than what is required for ordinary structural steel framing.

To that end AISC has established the designation Architecturally Exposed Structural Steel (AESS). The various requirements for AESS are covered in Section 10 of the AISC *Code of Standard Practice for Steel Buildings and Bridges*, available as a free download at **www.aisc.org/freepubs**.

A good additional reference is the AESS supplement to the May 2003 issue of *Modern Steel Construction*. It includes a sample AESS specification and discusses some of the aspects of specifying AESS that may add significant costs to the steel package. For a free online version of that supplement, go to **www.modernsteel.com/backissues**. For more up-to-date pricing information regarding the use of AESS, contact the AISC Steel Solutions Center at **www.aisc.org/ssc**.

topics. However, a few questions will need to be asked of the architect. For example, if the structural steel will be exposed after construction, is an architecturally exposed structural steel (AESS) framing section required? As another example, will the structural steel receive spray-applied fire protection? If so, and the common case of no paint or primer on this steel is not applicable, coordination is required to ensure that the coating and fire protection are compatible.

Architecturally Exposed Structural Steel Framing—If the design requires architecturally exposed structural steel, the architect's expectations of the finished product need to be vetted, especially with regard to the appearance of welded joints and final finish. The surface preparation and the primer selection need to be coordinated with the final finish expectations. The majority of the time, a high-performance coating will be required. In my experience the high-performance coating has appeared in both the architecturally exposed structural steel framing section and the high-performance coating section. Coordinate with the architect as to where the coating, including the primer, will be specified. (See AESS sidebar.)

Steel Joist Framing—This section is similar to the structural steel framing section as far as coordination requirements. Coordination items include shop priming and the need for fire protection.

Steel Decking—In addition to shop priming and fire protection requirements, one more thing needs to be pointed out. Many times I see this section with every manufacturer listed. Please either select five or so preferred manufacturers or delete the entire manufacturers paragraph. If there is no preference, let the ASTM standard govern. If there is a preference, select it. There is no need to waste paper by listing manufacturers if any one of them will do.

Cold-Formed Metal Framing—This section is one that often creates confusion concerning who should write it. The structural engineers don't want to write it because it is not part of the primary structure, and the architects don't want to write it because a lot of this steel has secondary load-bearing requirements. Items specified in this section include load-bearing wall framing, exterior non-load-bearing wall framing, floor joist framing, roof rafter framing, ceiling joist framing, and soffit framing. The item specified most often is the exterior non-load-bearing wall framing. Why? Many cities and villages now require rooftop mechanical equipment to be screened from view. The exterior non-load-bearing wall framing is used as support for the penthouse screens, which must be designed and sized to withstand wind loads and deflection. Many architects are not qualified to perform those calculations. I know I'm not qualified to do so. I would be happy to edit the section to include only the items needed for the project, but would then prefer to pass the section on to the structural engineer for their final input.

Miscellaneous Metal Fabrications—This is a section that some structural engineers like to author. I would prefer that the structural engineer review and edit a specification that a specifier has drafted. There are many more non-structural items in this section that need to be coordinated with the architect than structural items. If the structural engineer would be willing to edit and re-edit the section every time the architect adds a cast nosing, pipe bollard, or angle corner guard, the specifier would be happy to let them edit it. However, these items are typically added at the last minute, not while the structural engineer is designing the structure. This section does have an item that is already covered in the structural steel framing section: prefabricated building columns. If the columns are on the project, coordinate whether they are covered in the structural steel framing or this section.

Specification Coordination Checklist

- ✓ Coordinate terminology on drawings and in specification
- ✓ Agree on MasterFormat version (1995 or 2004?)
- ✓ Discuss LEED Certification– Is it required? What level of certification?
- ✓ Request Section Format from specifier/architect
- ✓ Coordinate primers, finish coats and fireproofing
- ✓ Edit list of manufacturers
- ✓ Inquire about the need for cold-formed metal framing—then write or review section
- ✓ Request metal fabrication section from specifier/architect for review
- ✓ Request metal stairs section from specifier/architect for review
- ✓ Request railing sections from specifier/architect for review

Metal Stairs—Again, this is another specification that some structural engineers like to author. However, in reality, the structural engineer can request this section from the specifier for review. As for the structural performance requirements for the stairs and railings, the master specifications include the load requirements from the 2006 *International Building Code*. I personally have not had a project requiring more stringent structural performance requirements than those included in the 2006 *IBC*. But once again, this is a section that the architect modifies up until the last minute, usually due to value engineering changes. The railing infill—and even the type of stairs—is subject to revision (preassembled steel stairs with concrete fill to industrial type stairs with floor plate treads). Some of the stairs included in this section are ornamental (architectural). When ornamental stairs are required, welding and final finishing expectations need additional coordination with the architect.

Pipe and Tube Railings—If the structural engineer wants to edit this section, the materials and finishes of the different types of railings required need coordination. I have observed that the structural engineer is really only interested in the structural performance requirements, not the materials and finishes. The master specification for this section, like many other structural steel sections, includes performance requirements according to the 2006 *IBC*. I believe a review of this section, after editing by the specifier, is all that is required.

Steel Piles—I've included this section as an example as to why it is important to determine which version of MasterFormat is being used. In the 1995 version, this was a Division 2 section. In the 2004 version, this, and several other earthwork related structural sections, are now in Division 31. Otherwise, generally there are no coordination items required between the structural engineer and the architect.

Part 3 – Execution

Critical to overall project quality, proper editing and coordination of specifications among disciplines will help to alleviate confusion within the documents. Hopefully, the end result will be fewer requests for information, fewer change orders related to requests for information, and fewer headaches (and pain relief medications) for the structural engineers, a benefit for all parties involved. MSC