

A Check-Up of Your Firm's Quality Assurance Plan

By Jeff Morrison

Many times, the phrases quality assurance and quality control are used interchangeably. Quality assurance (QA) is process-focused, where the processes are put in place to ensure the correct steps are performed. Quality control (QC) is used to verify that deliverables are of acceptable quality and that they are complete and correct. As this relates to structural engineering, one may think of QA as the process we go through during our design and construction document production phases and QC as the review exercise at the end of a project to determine how well the process worked in producing a quality set of construction documents that met the needs of the client, owner, and contractor.

It is critical to make sure that all staff understand the important goals of this process, such as increasing the quality of the firm's work product, decreasing liability, and serving as a learning opportunity. The process should be approached in a context of teamwork and camaraderie; this can go a long way in building a culture of quality and obtaining buy-in from all staff. The goal of the process is not to be burdensome or add another task but rather, in the long term, to increase efficiency and learning.

Recommendations

Have a kick-off meeting with the entire project team to get the project off on the right foot in the early Concept/Schematic Design phase. Involve all staff working on the project, including engineers, technicians, and the QA reviewer. At this meeting, share the project background information, client, consultants, scope, and schedule. Review the main elements of the project such as gravity framing systems, lateral-load-resisting systems, foundation system, basic wall sections, serviceability requirements, and any special requirements or unique details that can be identified. This can also serve as a mini design charrette to brainstorm ideas and start thinking about some of the more challenging aspects of a project. Review with the technical staff the organization of drawing sheets, building information modeling (BIM) model, as well as BIM execution plan requirements and BIM level of development requirements.

After completion of the Design Development phase, a formal QA review should be performed. This is an excellent opportunity to

review all major structural elements, design criteria, typical wall sections, and details. This check is important to make sure all primary elements are properly accounted for in the most efficient, economical, and constructible way early in the project. It will also serve as a check to verify if the assumptions and decisions made at the project kick-off are still accurate or if any adjustments need to be made.

A thorough QA review should be performed near the end of the Construction Document phase; additional reviews at appropriate milestones during this phase should also be performed for larger or more complex projects. These check-in reviews can serve to make sure the project stays on track throughout a lengthy design process. At this point, the review should be focused on the details of the project and coordination with architectural and other consultants. Dimensional and detail coordination is essential at this stage. At this point, an engineering design and construction documents checklist can be used as a valuable tool.

Challenges

Several factors can make the QA process for structural engineering firms challenging. Our design process and each project are typically different and unique. Whether it be a fast track schedule, architectural challenges, existing building or site conditions, or complex owner requirements, all of these items make the development and implementation of a quality assurance plan that applies to all project sizes and types a challenge.

- **Time** – We are all busy, and making time for additional review during the design process can be a challenge. However, the QA process needs to be looked at as one that can be a great tool to increase efficiency, improve quality, provide excellent learning opportunities, reduce construction phase issues, and decrease liability exposure.
- **Scalable** – The plan should be nimble and scalable to work for the smallest to largest project. The smallest project may only require a brief review of the final documents at the end of the project. The largest and most complex projects will likely require multiple check-ins during each phase to verify that the project team is staying on track and on schedule.

Resources

CASE has several documents and tools available to assist with the QA process. These include:

- CASE 962-D – *A Guideline Addressing Coordination and Completeness of Structural Construction Documents*
- Tool 1-2 – *Developing a Culture of Quality*
- Tool 9-1 – *A guideline Addressing Coordination and Completeness of Structural Construction Documents (includes a drawing review checklist)*
- Tool 9-2 – *Quality Assurance Plan*

- **Accountability** – What will be the means to track accountability to make sure the process is being followed? This needs to be a consistent emphasis to all staff during regular staff meetings. Adequate time needs to be built into the production schedule to allow for both the QA review, and analysis and response to the comments. This will build a culture of quality, and, over time, it will become an ingrained part of the project planning process.

Questions to Consider

A few questions to consider in the review of your firm's QA plan:

- Who will perform the QA reviews, and how will this be assigned for each project?
- What projects require a QA review, and how will this be determined for each project?
- When will the QA reviews occur?
- Why are we doing this? Buy-in from all staff and understanding the importance of this process is critical to making sure it happens and that the process is given the care and attention it deserves.
- How will this fit in our work process schedule?▪



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