

Cedar Rapids Public Works Department

Standard Operating Procedure



Procedure Name: Quality Assurance / Quality Control	Approved By: Doug Wilson	
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Date Revised or Reviewed:	Revised or Reviewed by:	Approved By:
Published Locations (manuals/websites/etc.): Project Development and Management Manual – After any revisions to this document, replace the obsolete version stored on this webpage.		

Purpose:

To summarize and document the process for managing project design quality.

Procedures:

Quality Assurance – (taken from the *Ultimate Public Works Management Manual, Copyright © 2015 by PSMJ Resources, Inc.*)

Quality assurance is an organization-wide process that includes all management activities, and it aims to “design and build quality” into the product as it goes through the various stages of engineering, design, and construction. The process includes a method of monitoring compliance with the firm’s quality requirements.

The overall goal of quality assurance is to *prevent* errors rather than *correct* them. The fewer the errors in design, the less time it will take to correct them, both in the design phase and, more importantly, during construction.

The purpose of a quality assurance program is to ensure that the design processes are correct and that quality control (QC) is being properly provided on every project. In other words, QA is an oversight function to make sure that QC is being properly conducted.

The QA plan should address the following aspects on appropriate projects:

- City requirements – Review the technical aspects of the project to determine if the design or study follows agreed-upon criteria and procedures, is appropriate to the City’s needs, and meets contract requirements. Ensure that the constructed project or study will meet the City’s needs, given the project’s scope, schedule, and budget.

- Design – Review the final set of plans and specifications to ensure appropriate technical requirements are incorporated into the project and to uncover potential design inconsistencies in order to minimize questions at the time of bidding and/or change requests following subcontract work.
- Constructability – Review the design to ensure the project is constructible and to identify potential construction problems prior to bidding the work.
- Maintenance – Review the design to ensure the project is maintainable and to identify aspects of the design that could make the facility difficult to maintain.

Quality Control – (taken from the *Ultimate Public Works Management Manual*,
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Quality control is a process to identify and correct errors and omissions in design plans before releasing the design to contractors. A common practice in the QC process is to have an “end-of-the-pipe” review by a senior design team member prior to sending out the deliverable. That’s better than no review at all but, it will tend to lead to some potentially negative outcomes. Rather than showing up at the end of the project, QC starts at the beginning of the project.

A good QC plan should define:

- Which documents should be reviewed
- Who should review them
- When should documents be reviewed
- What kinds of errors will be sought

Here are five kinds of QC reviews commonly performed on design and study projects and an explanation of what the reviewer should look for:

- Intradisciplinary review: An experienced person from each discipline who worked on the project checks the applicable calculations, drawings, and specifications produced by that discipline.
- Interdisciplinary review: One or more individuals from the project team perform a detailed review to ensure consistency and identify inconsistencies between disciplines.
- Drawing to specification cross-check: This check is conducted by the project team member who reviews the specifications page by page. He or she will identify information that will also appear on the drawings and check for inconsistencies between the drawings and the specifications.
- Constructability review: This review identifies design features that may be difficult (or even impossible) to build at the job site. Input from experienced construction personnel early in the design can identify problems.
- Maintenance review: This review identifies design features that may be difficult to maintain at the completion of the project. Input from the City’s Streets department early in the design can identify problems.

Refer to document: [SOP – Plan Review Process](#)

Refer to the *Checklist* tab in the *Project Development Guide* for each submittal stage for a list of design criteria to be checked and what should be included on the plans.

Refer to document: [Template – Project Development Guide](#)

Consultant QC/QC

Per the language in a standard PSA:

20.0 STANDARD OF CARE AND ISSUES OF LIABILITY

- 20.1 *The Consultant shall perform services for, and furnish deliverables to, the City pertaining to the Project as set forth in this Agreement. The Consultant shall possess a degree of learning, care and skill ordinarily possessed by reputable professionals, practicing in this area under similar circumstances. The Consultant shall use reasonable diligence and professional judgment in the exercise of skill and application of learning.*
- 20.2 *Consultant represents that the Services and all of its components shall be free of defects caused by negligence; shall be performed in a manner consistent with the standard of care of other professional service providers in a similar industry and application; shall conform to the requirements of this Agreement; and shall be sufficient and suitable for the purposes expressed in this Agreement.*
- 20.3 *Consultant shall be responsible for the quality, technical accuracy, completeness and coordination of all Documents and other items and Services under this Agreement. Consultant shall, promptly and without charge, provide all corrective Services necessary as a result of Consultant's negligent acts, errors, or omissions, with respect to the quality and accuracy of Services and Documents.*
- 20.4 *Consultant shall be responsible for any and all damages to property or persons as a result of Consultant's negligent acts, errors, or omissions, and for any losses or costs to repair or remedy any work undertaken by City based upon the Services as a result of any such negligent acts, errors, or omissions.*
- 20.5 *Except as set forth in Section 19 above, Consultant's obligations under this Section shall exist without regard to, and shall not be construed to be waived by, the availability or unavailability of any insurance, either of City or Consultant.*

This does not mean that the plans will be perfect and free of any design errors or omissions. It does, however, mean that the Consultant is expected to provide their services with a reasonable "standard of care". Implementation of a quality assurance/quality control program demonstrates that "standard of care".

It is expected that the Consultant has a quality assurance (QA) plan in place to ensure quality in the process they are following when preparing design plans and that they are internally reviewing the plans (QC) before sending them to the City for their review.

To ensure that the Consultant is providing quality control, both the designer and a second person who reviewed the plans shall sign the cover sheet of the plans at each stage of plan submittal to indicate that QC was performed. The Consultant shall also list

the name of the designer and the reviewer in the appropriate row of the checklist for that stage.

The Consultant's review should be more rigorous than the City PM's review.

The City is not expected to make detailed checks of dimensions or calculations relative to the project, but to review the project to ensure that it meets the established technical goals and that the design is appropriate, constructible and maintainable.

The quality "litmus" for a set of contract documents reviewed by the City is whether or not someone who is unfamiliar with the project can tell what's supposed to be built. The City reviews the plans with this fact in mind, recognizing the purpose of their review is to determine suitability for use, not to require perfection.