

EFCOG Best Practice #60 Construction Specifications

Facility: Los Alamos National Laboratory, West Valley Demonstration Project

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Brief Description of Best Practice: Maintaining Accurate and Up To Date Construction Specifications

1. Up to date references

A simple matrix (in the form of a spreadsheet or database) can be developed that cross-references the specifications and the references (e.g. codes and standards) listed in each (see table 1.1 below for an example). With this type matrix it is clear what specifications need to be updated when a reference changes. There is some initial cost to develop a matrix but the increased efficiency of the change process and cost savings from avoiding change orders and schedule delays more than compensates for the development costs.

Specification Section	ACI 319	ACI 341	ACI 301	ACI 347	ASTM C 1260	ASTM C 94	ASTM C 142	ASTM C 39	AASHTO O 303-
03 1512	X	X	X	X			X	X	
03 1534	X	X				X	X	X	
03 1550			X	X			X	X	X
03 3001	X	X	X	X	X	X	X	X	X
03 3053	X		X				X	X	X

Table 1.1 Specification/Reference Matrix

2. Accurate account of submittals

Each specification or procurement document should clearly identify the required submittals by listing all of the required submittals for that section. This allows the subcontractor to quickly determine the type and number of submittals required and also allows improved tracking of submittals by the owner. In addition, submittals should be divided into two categories, those that are reviewed and approved and those that are records of activities performed (see table 2.1 for an example).

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Document Category Number	Specification Paragraph Reference	Document Description	Permission to Proceed Required		Submittal Schedule (per Section 01300 para. As shown)	Quantity Required		Kind of copies	Remarks
			Yes	No		Init	Final		

Table 2.1 Engineering Document Requirements

Why the best practice was used: Inaccurate or out-of-date construction specifications references can add a potentially significant cost and schedule burden (e.g. rework, nonconformances, and work delays) to projects and adversely affect the quality of the final product.

What are the benefits of the best practice: Clearer interface with subcontractors and suppliers to ensure design and quality expectations are specific and there is little room for interpretation that could result in less than expected item or activity quality.

What problems/issues were associated with the best practice: Ensuring that subject matter experts developing the matrix had access to the most recent revision or addenda of the available codes and standards. Access to these codes and standards requires keeping an up to date library that may come with a price for membership or distribution listing. Again the savings for doing it right the first time will outweigh the cost. Consider one company library with access for employees needing this information to save on cost of multiple libraries.

How the success of the Best Practice was measured: Verifying the cost of delays from projects not using the latest codes and standards to projects that did it right the first time. The positive difference in cost and schedule are very noticeable for the bottom line.

Description of process experience using the Best Practice: Early in a relative large construction project a nonconformance was written on conduit over fill. The contractor insisted that their design organization used the National Electrical Code (NEC) calculations. After several days of discussion it was learned that the NEC software used by the design organization was four years out of date and the calculation tables had been revised in the NEC. Up to date NEC conduit fill software was installed and the remainder of the project went smooth. A new (larger) conduit was installed to correct the original issue. Had this issue not been corrected early in the construction process one could see how expensive this mistake could have been. Using this best practice to ensure that the codes and specifications reference including the most up to date revisions has prevented other such issues.