
Quality Manual Guideline



Introduction

Each revision to the American Institute of Steel Construction's Certification Program during the past 25 years is the direct result of input from fabricators, specifiers and, most importantly, owners and developers. The most recent change in the program is the adoption of the Certification Standard for Steel Building Structures (Standard). This Standard describes the total quality management system certification for fabricators of steel building structures.

Under this new Standard, fabricators are required to develop and implement a quality management system and to describe it in a quality manual and in required procedures. To assist you in developing your firm's quality system documentation, AISC offers this Quality Manual Guideline.

The quality management system described by the Standard includes elements of a quality assurance system and elements of a quality control system—it is much more inclusive of how quality is addressed in your facility throughout the entire business of fabrication.

If your facility has no existing or sparse documentation, this guideline is provided as assistance to begin your thought process. If you have a mature existing documented system, this Guideline will help you to make a fresh review, to update your system, and to make further improvements that can improve your business processes.

The structural steel fabrication industry is diverse—as are its methods and procedures. As a result, this document offers suggestions but recognizes that each fabricator will have a unique approach. If your firm has a quality manual that covers the required elements, you do not have to change your manual. Nor does the AISC Certification Program require a separate quality manual. Because the AISC Certification Program is specific to the structural steel industry, it includes elements not found in other programs. Therefore, if your existing manual or system was prepared in accordance with ISO 9001, ASME, or a private company specific requirement, you should compare your manual with the requirements of the Standard to ensure that all required elements are covered.

Remember, this Guideline is generic and you may need to increase or reduce the detail of individual procedures to match how you do business. Always address how the requirements of the Standard can best be satisfied at your facility—comparison with other facilities is not always helpful. Your number of employees, the competency and training level of your employees and the complexity and variety

of the projects that your facility undertakes are just a few factors that contribute to how detailed or simple your quality documentation becomes to address the requirements of the Standard.

It may not be necessary to change what has been successful for you in the past. However, it is required that you formalize these systems by writing them down and assuring that the responsible personnel understand your requirements and have implemented them effectively.

You may be interested to know that many first-time fabricators that are now certified and that have gone through the formalizing of their own procedures, have reported to AISC that they have seen marked improvement in their ability to meet their customers needs, to increase their business volume, and to better their profit outlook.

In addition to this Guideline, example procedures are provided for some of the elements of the Standard; however, these procedures should not be construed as acceptable as written for certification for an AISC certification audit. The chosen examples do not cover all the procedures required by the Standard for Steel Building Structures, and each procedure may not address all the requirements of each element of the Standard for Steel Building Structures.

To get started, refer to the definition of a documented procedure in the Standard. The minimum procedure requirements from this definition are summarized below:

1. Purpose (of the procedure);
2. Outline steps within the procedure functions
3. Assigned responsibilities;
4. Identify generated records;
5. Review responsibility (of the procedure)

The following page contains a complete list of required procedures and documentation.

Quality Manual Documentation	
Element	Title
8.3	Cover Page
5.6.2.2	Approval by the Highest Ranking Manager Responsible for the Facility
5.6.2 Para. 2	Description of the Quality Management System
5.6.2 Para. 1	Quality Policy
5.6.2 Para. 1; 5.4.1	Organization Description
3	Applicable Reference Documents, Codes and Contract Requirements.
5.6.2 Para. 2	Description of Interaction and Communication Between Processes
5.6.2.1 Para. 2	Additional procedures/documents/drawings beyond the minimum req.

Procedures (separate or in the Quality Manual)		
	Element	Title
1	6 Para. 1	Contract and Project Specification Review
2	7.1.1 Para. 1	Preparation of Shop and Erection Drawings
3	7.1.3 Para. 1	Provisions for Checking Shop and Erection Drawings
4	7.2.4 Para. 1	Receipt of Shop Drawings from Customer
5	7.2.4 Para. 1	Revisions to Shop Drawings from Customer
6	7.2.4 Para. 1	Control of Shop Drawings from Customer
7	8 Para. 1	Control of Documents and Data
8	8.2 Para. 1	Receipt and Document of Customer Requirements.
9	9 Para. 1	Control of Quality Records
10	10 Para. 1	Purchasing
11	10.2 Para. 3	Evaluation of Sub Contractors
12	11 Para. 1	Material Identification
13	12.1	Weld Procedures (WPS) and Weld Operator Qualification
14	12.2	Bolting Installation
15	12.3	Material Prep for Coatings
16	12.4	Coating Application
17	12.5	Preventative Maintenance of Equipment
18	13 Para. 1	Inspection and Testing
19	14 Para. 1	Control of Inspection, Measuring and Test Equipment
20	15 Para. 1	Control of Nonconformities (non conforming product)
21	16 Para. 1	Corrective Action
22	5.6.2.1 Para 2	Additional procedures beyond the minimum required (Optional)
23	12 Para. 1	Special procedures for fabrication processes (Optional)

From the Standard:

Management Responsibility Sections 5, 5.1 and 5.2

Management of the Fabricator shall be responsible for defining and adopting a commitment to quality; directing and leading the Fabricator to achieve that commitment; determining and providing the personnel and resources necessary; overseeing the procedures and practices necessary; and implementing the systems to comply with and to assure that the goals of the commitment have been met.

5.1 Commitment (Policy)

Executive Management shall adopt and document a policy (or policies) defining the quality management system goals of the Fabricator's organization. The document(s) shall state objectives for quality and management's commitment to quality. The policy will, at a minimum, commit to meeting contract requirements.

The policy shall be disseminated to personnel affecting quality. The management shall ensure that the policy is understood, implemented and maintained at appropriate levels of the Fabricator's organization.

Element 5, 5.1. 5.2 Management Responsibility

Key Concept(s):

Define Goals

Document a written Quality Policy which commits to meeting contract requirements and includes the quality management system goals and objectives for quality that you have for your company. The policy is to be distributed to personnel within the company "who affect quality."

Separately, ensure that the policy is understood, implemented and maintained at "appropriate levels" within the company.

Plan to reach goals and provide for measurement and evaluation

Your Executive Management needs to demonstrate that there is a plan to

- (1) realize the goals of your company concerning quality,
- (2) evaluate the current level of achievement of those goals
- (3) make provisions for continuous improvement (opportunities for improvement) to the QMS
- (4) address and resolve customer complaints.
- (5) Determine a specific method of review of these items appropriate for your business.

Sample Procedure Included with this Guide

Sample Quality Policy

Required Documentation

Quality Policy

Interpretation

The success of your Quality Management System (QMS) depends on the commitment of your management team to implementing the program. Because of the importance of this program, it is critical that your executive management team is involved not just in developing the QMS, but also is involved in regularly reviewing the program.

An important part of the program is the ability to demonstrate management's active involvement in the QMS. **Examples** of how to demonstrate management involvement include:

- Having members of the management team establish reporting systems on key performance factors relating to the QMS;
- Establishing regular management reviews of the QMS;
- Having management involvement in regularly scheduled quality topic meetings to foster understanding by all individuals in the company.
- Developing any quality-related procedures in addition to those required directly by this program that are essential to your business.

The key measurement for management involvement is the company's commitment to resolve quality issues and to make staff aware of their responsibilities related to quality issues. Additionally, a key measurement is management's regular review of the quality management system.

5.2 Direction and Leadership

Executive management shall direct the development of systems necessary to achieve the goals of the Fabricator's policies. The systems shall comply with the requirements of this standard. Executive management will demonstrate that there is a plan to realize the goals and evaluate the current level of the achievement of those goals-the effectiveness of the program.

Management shall provide direction and leadership consistent with the policies and monitor the effective implementation of those systems.

Management shall provide adequate resources and channels for communication to address and resolve customer complaints. Management shall be responsible for qualification of personnel.

Executive management shall review the organization's quality management system at planned intervals to ensure its continuing suitability, adequacy and effectiveness. This review shall include assessing opportunities for improvement and the need for changes to the quality management system, including the quality policy and quality objectives.

Records from management reviews shall be maintained. Management

As part of your plan to demonstrate compliance, you may include a management responsibility section in your Quality Manual. In this section, identify your executive management team (the titles of the individuals who manage the key functions for you). Next, establish who has responsibility for the key business/quality functions, (reference the bulleted items in 5.4.1) Also, establish the frequency of management team meetings and the necessary agenda items (check this against the list in 5.2 of the Standard). Weekly project review meetings do not typically address the complete functions of the quality management system and do not fulfill this requirement. Finally, describe how records will be kept (for example, the QA Manager may be assigned to file and keep a simple log of issues and actions so a record is maintained and it can easily be determined whether the issues were resolved in an appropriate time period that you determine).

Policy Statement

A basic tool for demonstrating management's commitment to quality is by documenting, defining and issuing a Policy Statement. Executive Management is responsible for establishing the Policy Statement, including the company's quality goals and objectives. At the minimum, the policy needs to state that your company has a commitment both to quality and to compliance with your customer's contract documents. Make sure your policy also addresses how your management team demonstrates its commitment.

The policy Statement must be disseminated to your employees whose work affects quality. Further, you must be able to demonstrate that your employees understand the policy, that it is implemented, and that it is maintained at appropriate levels within your organization.

However, not everyone in the organization needs to have or be aware of all policy statements. Certainly your accounting or reception personnel, if they do not have quality responsibilities, do not need to be involved in this issue.

Since knowledge of the QMS is required for employees who effect the quality of your product, training is usually required throughout the company to instill that knowledge.

In addition to training, you may choose to have all managers receive and sign a copy of the Policy Statement. Likewise, it should be included in your new employee orientation program. One method of dissemination could be the posting of the policy in prominent locations throughout your office and plant.

Another way to help inform appropriate personnel about your quality goals is to incorporate discussions of quality at meetings normally unrelated to your company's QMS. These types of discussions are particularly helpful in evaluating your company's progress toward meeting your identified QMS goals. If quality issues are discussed as part of a meeting, simple records might be maintained about who attended and what was discussed.

Direction and Leadership

The Standard for Steel Building Structures clearly places the responsibility for direction and leadership of the QMS squarely on the shoulders of company management. The Executive Management is ultimately responsible with ensuring the development, implementation and maintenance of the systems necessary to assure compliance with the contract documents, the requirements of the AISC program and your own QMS. At the same time, it is important to have systems in place to measure the effectiveness of the implementation program.

One method (required by the program) to assess the proper functioning of the QMS is to conduct a management review on a defined regularly scheduled basis. When setting your agenda (assure that items from element 5.2 are included), consider including: complaints from customers: shop and field reports of errors: other internal reports of deficiencies: and the results

review requirements will be defined by the Fabricator. This will include a specific method to obtain, report and appropriately analyze the following:

- results of internal and AISC audits,
- customer feedback, (examples may include: surveys, letters of recognition, personal interviews, requests for corrective action and complaints)
- process performance and product conformity, (e.g. back charges; internal error trends with fitting, welding, bolting and coating application processes; detailing errors; shipping delays; or equipment failures.),
- output from previous management reviews.

The output from the management review shall include the record and implementation of any decisions and actions related to:

- improvement of the effectiveness of the quality management system and its processes,
- improvement of product quality,
- resource needs.

from surveys taken of customers and others contacted concerning your company's performance. You need to maintain logs of these items on a regular basis. For example, each time a report or back charge resulting from an error is received, it should be investigated and the information reported. A determination should be made to see if it was a detailing, fabrication or erection error. The error can be further examined to identify the cause of the problem and, if it is a reoccurring problem, a method should be developed to correct the deficiency. This type of assessment will help to determine if the problem is in one particular operation or if personnel need additional training or direction. If a particular piece of equipment is the problem, a review of its calibration, maintenance reports and applicable use might resolve the difficulty.

Management can also set up periodical reviews of quality reports generated from each department during which your staff should be encouraged to discuss improvements to resolve quality issues. Keeping a record of these meetings will help document management involvement in the quality process and ensure proper correction and follow up that improves business.

Internal audits (which are discussed more fully later in this guide) are an excellent way for management to discover any quality issues that may exist within your organization. The results of these audits are a required item on the agenda of your management review. Note that these internal audits must take place at least once per year.

In your discussions of Direction and Leadership you must state your plan of how your company will achieve overall compliance of the goals included in your commitment policy and how you are evaluating the current level at which you are achieving those goals. How you will monitor this plan on an on going basis must be stated. The monitoring can be in the form of internal audits (see section 19). Depending on circumstances the audits may be performed on the entire company or individual departments. How often and by whom these audits will be performed needs to be stated. Notice in task 19 that a total company audit needs to take place at least once per year.

If customer complaints are received state to whom they were channeled for disposition. Develop a method on how this person resolves the issue of the complaint and define who will sign off that the complaint has been satisfactorily handled.

When the standard asks for "records" the auditor can ask to see what you have to satisfy this requirement (see section 9).

For each management review prepare a report containing the subjects discussed (the definition of the review), attendees, directions decided upon, and assignments made to address specific issues. Maintain a folder of these reports at a central location (possibly by the management representative). The definition of the review must contain a method to obtain, report and appropriately analyze the bulleted items in section 5.2 of the standard. For instance, you might state:

- 1) That you have a standard method to measure the effectiveness for each department during the internal audit and that the results of these audits are reviewed by management in order to make continuous improvements in the quality of the company's performance.
- 2) That you send a survey card or make a telephone survey to each customer once a year or after completion of a major (define) project asking for comments about your firm's performance.
- 3) That survey comments are categorized and evaluated by management on a defined schedule (state the schedule).
- 4) That you maintain a file of commendations.
- 5) When backcharges, QA/QC reports of errors, or any other report of poor performance are received, that they are broken down by cause, they are analyzed, and the results presented to management. Management is to assure that assignment of responsibility to personnel, equipment, training have been adequately reviewed with appropriate changes instituted for improvement of the company.

Tip(s)

You should define for purposes of the QMS what your company means by "executive management". It could be one person (the CEO), or several persons (the CEO plus major department managers). Notice that "executive management" may be different from the "management representative" or the "executive management team".

Management review meetings demonstrate commitment to your quality management system—and that the plant's chief executive has reviewed the system. The management representative is directly responsible to assure:

- (1) there is a written procedure for every operation required by the Quality Program;
- (2) the procedure has been implemented; and
- (3) the procedure is effective.

Quality Record

- Output from quality meetings
- Records of management's review of the quality system (required)
- Data that demonstrate attainment of quality management system goals
- Documentation of communication to employees about company goals, performance and quality policies.

Section 5.3 Management Responsibility

Key Concept(s):

A single member of management at your company must be designated as your Management Representative and that individual has the responsibility for your company's quality system.

Required Documentation

The identification of the Management Representative in your QMS definition.

Interpretation

The individual designated as Management Representative should understand all of the company's quality procedures and have the authority to implement those programs necessary to achieve the quality requirements of the company. Therefore, it is essential that the Management Representative be a member of the management team, though they don't need to be a QA (quality assurance) or QC (quality control) person. Although the Management Representative may not be the individual who actually prepares all the reports to management, the responsibility and understanding of the data are here to assure that it is accomplished. While you may be tempted to choose an inspector for this position, that is only an appropriate choice if the individual has management responsibility within your company. The Management Representative also will be the main contact between your company and AISC pertaining to fabricator certification.

The position of management representative should appear in your organization chart and the appointment of this position should be done in writing.

The management representative has primary responsibility for the QMS and must be assured that it has been established, written down, implemented, personnel are properly trained, and that it is being maintained. By being maintained the standard means that, as problems are uncovered that solutions are found, implemented, and retesting takes place to assure that the solutions are working. The management representative also must make sure that the customer requirements are properly addressed during the project review as outlined in the standard (section 5.5 and 6).

By "liaising with external parties" the standard refers to contacts you might have with organizations such as QMC or ISO.

Tip(s)

The Management Representative must know the quality management system, the reporting methods and be involved with the analysis of quality issues. Be sure to show the Management Representative position on your organizational chart or in the definition of your quality management system.

Quality Record Examples

None mandated by the Standard for Steel Building Structures

From the Standard:

5.4 Resources

The Fabricator will have the resources needed to achieve conformity to contract specifications. Resources will include, but are not limited to, the resources described in the sub-articles of 5.4.

Personnel

The responsibility, authority and the interrelation of personnel who manage, perform and verify work affecting quality shall be defined and documented using organization charts and job descriptions or other suitable means. Personnel performing assigned functions must have qualifications that indicate the ability to successfully perform the function. Unless otherwise noted, personnel can be assigned to more than one task, provided they are qualified and able to accomplish the duties of each position. Specifically, the individual(s) responsible for Quality Assurance and Quality Control management shall not report to production management for items related to quality.

Qualified personnel will be assigned to manage the functions detailed in sections 5 through 20 of this standard and shall include as a minimum:

- Management

Section 5.4 Resources

Key Concept(s)

Your organizational chart must clearly show lines of responsibility, authority and the interrelationships of personnel from all areas of your company.

Job descriptions for positions of key personnel effecting the quality of the product must be written and must include the qualifications and specific duties necessary to perform the work. The descriptions do not need to be part of the quality manual.

You must clearly demonstrate that your facility, building and equipment is sufficient for the type of fabrication you are performing.

Interpretation

Since Executive Management usually controls the budget, the rest of the organization will look to the Executive Management to institute changes and/or additions to the company's resources in order to ensure that work can be properly performed.

Management also defines the lines of responsibilities and reporting within the company and an organizational chart or other tool should clearly illustrate these lines of responsibility. In general, people can be assigned to more than one task, provided they are qualified and are able to accomplish the duties of the various positions assigned. For example, the QC Manager may also be the Purchasing Manager.

Compliance to the Standard for Steel Building Structures does not require the creation of positions with specific titles and/or responsibilities. At a minimum, however, the organizational chart must show who has responsibility for detailing, purchasing, fabrication, quality assurance and quality control.

The separation between managers responsible for production and managers responsible for QA/QC is important in your quality program. Therefore it is critical to establish the autonomy of the quality assurance and quality control management. This can be demonstrated by having direct reporting lines between those positions and top management, thus assuring independence from production management to make critical decisions on quality issues that may adversely impact schedules. Your complete quality function must be independent from production. That does not mean that an individual in a smaller organization cannot perform both duties. For example, a craftsperson may perform visual inspection on another's work, but they must report to an independent QC function when performing those duties, not to shop supervision responsible for production.

It is also important to understand the difference between Quality Assurance and Quality Control and take advantage of what each has to offer your business. The QA function's responsibility is to set the requirements, acceptance criteria and the frequency of examination, usually through the development of a sampling plan. The QC function is to perform the actual inspection of production work in accordance with the criteria established by QA. The QA function also includes evaluation of the work performed by QC.

Since, on occasion, the QA department may be critical of the QC department's work, manage-

Representative

- Detailing Management
- Purchasing Management
- Fabrication Process Management
- Quality Assurance Management
- Quality Control Management

Buildings, Workspace and Associated Utilities,

A fabrication facility shall consist of areas and buildings that provide space for the routine functions considered to be part of steel fabrication, including administration. The areas and buildings shall be conducive to achieving consistent quality work.

The fabrication facility shall include suitable areas for administration, quality assurance, quality control, detailing; adequate space for fitting, bolting and welding; provide ambient conditions conducive to acceptable work in all areas of the facility; suitable areas for receipt and storage of raw materials, consumables and hardware, storage and shipping of fabricated materials and coatings if coating application is performed by the Fabricator.

Process Equipment (both hardware and software)

The Fabricator shall

ment must carefully assess that both functions are working correctly and are not compromised.

It is also management's responsibility to clearly define the responsibilities for both the QC and QA function and to provide a job description. The job description has two elements: (1) the duties and responsibilities of the position; and (2) the qualifications needed to fill the position. Qualifications include education, training and work experience that indicates they have the ability to successfully perform the assigned responsibilities. The resumes or biographical information sheet for your management team and other personnel functioning in the quality system must be provided. Likewise, management records should include (though not as part of the Quality Manual) a list of the personnel that currently fill each position on the organizational chart along with their qualifications.

If you need to fill a position with a person who has some, but not all, of the qualifications for the position, you need to indicate what process is being followed to upgrade the person's skills. This often takes the form of education or training along with a timetable for obtaining the necessary qualifications. This information could be reported in the individual's personnel folder.

Facility

For application to the AISC Certified Fabricator Program, you will need to provide a drawing of your facility. This drawing should show the general outline of the production, administration and storage areas as well as the location of key equipment.

The drawing contributes to demonstrating that your company's facilities and equipment are sufficient to produce the work for which you routinely contract.

Equipment

All fabricators perform certain basic functions (such as hole making, bolting, welding and cutting) and the equipment necessary to perform this basic work should be available and in good working order at all times. This equipment also must be appropriate for the work being performed and the quality required. For example, if you were to cut the bearing end of a column, you would obviously need the equipment to provide the proper finish requirements specified in the AISC Code of Standard Practice. In a similar vein, you would not weld with a welding machine that regularly produced welding discontinuities.

Of course, it is not unusual to quote and receive contracts for projects that require equipment capabilities greater than is usual for your firm. In preparation for such an occurrence, you need to demonstrate that you have the ability to adjust your facility to provide the required capacities. This includes the selection of methods and equipment to assure the quality of the fabricated members produced in this custom fashion. Further, if the required equipment is to be leased or rented, the equipment must be under the fabricator's control and subject to the maintenance requirements of the fabricator. If heroic methods must occasionally be employed--for example turning a member much larger than regularly handled in your facility--you must demonstrate that the methods can be executed without damaging the product. Evaluate your plans to accommodate special work

Prepare an equipment list outlining all owned, leased and rented fabricating, coating, lifting and transportation equipment. The list does not need to be part of the Quality Manual but must be available to assist you in demonstrating maintenance of your equipment later in the program. For application to the AISC Certified Fabricator Program, you must provide an equipment list.

have under their control the equipment necessary to perform the functions common to fabrication consistent with the specifications and standards common to the work. Equipment must be maintained to produce the required quality.

Tip(s)

For instance smaller firms, it is typical for the CEO to manage the QA, QC and Production functions. Therefore, Quality and production can report to the same individual when it is the CEO. Use your internal audit program to determine if you can make decisions for production and quality separately, and favor quality when there is a choice. Additionally, while there may be separate positions for QA and QC, if the company cannot afford two people to fill these slots they can both be filled by the same individual. This is acceptable provided that the individual filling both slots understands and can articulate to the auditor the differences in functions and responsibilities of both and demonstrate independence when the QA function evaluates the work of QC and when QC evaluates work in accordance with established acceptance criteria.

Because people sometimes change positions or leave the company, it is recommended that the organizational chart provides only the position title or work function rather than the name of the individual who fills a particular position. However, your files should include information on the education, training and experience of each member of your management team. Additionally, make sure you have defined and documented the qualifications of each position in your company and that the people filling each position have the necessary qualifications.

From the Standard:

Internal Communication Section 5.5

Executive management shall ensure that appropriate communication processes are established within the Fabricator's organization and that communication takes place regarding the effectiveness of the quality management system.

Section 5.5 Internal Communication

Key Concept(s)

Communicate internally in a manner that will, for your company, be most effective in assuring that proper quality will occur.

Interpretation

There are variations in the ways that companies communicate within their own organization. For instance, some companies have methods of communications that are very formalized. The communications in these companies may take the form of reports or memos and/or meetings that are required at specific times. Other companies may not have formalized their communications within and/or between departments and instead have reports or memos and meetings on an "as needed" basis or none at all. However, regardless of your corporate culture, when it comes to your quality management system, it is often helpful to document instructions and meetings. For example, consider how you communicate to the shipping department that a special requirement is to be followed on a particular project? If you have more than one shift, are all shifts given the same information on a consistent basis and at constant times, such as at the start of each shift. It may be that many of the requirements of the Steel Building Structures Standard are being met by your organization but are handled in casual conversations, in person or over the telephone, instead of by memo or report. While these "casual" procedures may work many times, the risk and potential for problems when they are not effective, can have devastating results. Your role in the quality management of the company is to assure that the correct procedures are used and to articulate the procedure and the reasoning behind the procedure during an audit.

Review your present methods of internal communication to see if some adjustments should be made to minimize potential misunderstandings and to assure the proper parties are notified of quality issues.

Tip(s)

From time to time personally check how well your internal communications are working. Speak with some of your detailing and production personnel on a specific job related item and test their knowledge of special project requirements. You may choose to confirm this in a memo and make it a part of your self-audit.

Quality Record Examples

- Memos that confirm interpretations of the QMS
- Posting of special requirements at specific locations in the office and shop.
- Minutes or records of regularly scheduled production meetings, kick-off meetings and job close-out meetings are examples of communication.

From the Standard:

Documentation Requirements Section 5.6

5.6.1 General Requirements

The extent of the quality management system documentation can differ from one organization to another due to the size of organization and type of activities, the complexity of processes and their interactions and the competence of personnel. Quality management system documentation shall include:

- documented statements of a quality policy and quality objectives (as described in 5.1),
- documented procedures and their associated quality records required by this Standard,
- documents needed by the organization to ensure the effective planning, operation and control of its processes and
- a Quality Manual.

5.6.2 Quality Manual

The Fabricator shall establish and maintain a Quality Manual outlining the quality management system implemented in the Fabricator's organization. The documented Quality Manual shall

Section 5.6 Documentation Requirements

Key Concept(s)

The Quality Standard requires various types of documentation that are dependent on the work you perform and the skills of your employees.

The Quality Manual is YOUR Company's system for quality and must reflect the procedures you use and the records you employ to achieve a quality product. It is what communicates how you want your company to run.

Within your Quality Manual you must discuss the level of authority that approves the original Quality Manual and therefore all of its revisions.

Interpretation

This item of the Steel Building Structures Standard concerns the compilation of certain portions of your Quality Program and will encompass some of the documents already discussed (e.g., Policy Statements) as well as documents to be discussed later in this guide.

Your company's quality management system program will be contained in a document called your Quality Manual and it will contain documentation requirements you develop as part of this program. Remember that if the type of work your company performs changes, your Quality Manual should reference the additional procedures you have developed.

Some of the documents in the Quality Manual describe your company's procedures—they tell how to do something (prepare shop drawings, maintain quality records, prepare welding procedures, etc.). A well-written procedure, with the appropriate records demonstrating execution, provides that assurance. The items that must be documented for your QMS are identified in the Standard and cover certain administrative as well as certain specific production operations performed in the fabrication and shipping of the product. Your Quality Manual also should include other procedures based upon your operation and that cover any special processes that you may use. Organize and design your documentation so that it reflects the way you organize your business so that it is a useful tool.

To help prepare your Quality Manual, and to better familiarize yourself with the Standard, it is recommended that you read through the Standard and mark each reference to a required procedure or record. The phrase "documented procedure" means that these items, as a minimum, must be defined in your Quality Manual and a description of how your firm handles these matters must be included. The first step, of course, is to determine if your company already has documented procedures for any of these items. You should also consider whether any of your existing procedures can be slightly modified to bring you into compliance. Once you've identified all of the procedures and the way in which your firm approaches them, there are a wide variety of approaches to incorporating these items into your Quality Manual. For example, you could create a separate document/procedure for each item. Or you could choose to define and document each item in a section of your Quality Manual—or in combination with other items in another procedure. Some sample procedures accompany this guide and you may choose to adapt these samples to fit your own operation.

Note that some documents, such as qualification records, job descriptions, equipment lists,

consist of the policies and organizational description .

The Quality Manual will describe the quality management system, including the documented procedures established and a description of the interaction and communication between the processes of the quality management system used by the Fabricator to produce products of the required quality.

5.6.2.1 Organization

Procedures may be issued separately or be an integral part of the Quality Manual. The Fabricator's management determines the level of detail in the Quality Manual, and referenced procedures. At a minimum, these documents must be detailed enough to adequately describe the Fabricator's quality management system that assures the production of quality product. Additionally, these documents must demonstrate compliance with this Standard.

Further required reference documents include: job descriptions and qualifications of key personnel, a facility plan and an equipment list. Management will define what additional required written procedures/drawings or other documents are required beyond the minimum requirements set by this Standard to

etc., that are part of the quality management system are not necessarily placed in the Quality Manual but can be contained elsewhere within your company quality documentation.

If you already have documented parts of a quality program, such as a Quality Control Manual, a Quality Assurance Manual, material control procedure or other procedures, they may be utilized with little change for your QMS documentation.

The top executive at the location of the facility must approve the Quality Manual. If there is a more senior management person at another location, their endorsement, while not required, is recommended to add another voice to the importance that quality has for the organization.

When the Quality Manual is revised the same level of executive endorsement received by the earlier Manual is to be applied to the revision. All the staff positions that received the original version will also get the revisions.

Tip(s)

As part of your review of your current system, list and locate the records you are already generating. Compare this list with the requirements of the Standard. Combine this list with any discoveries from your internal audit process.

"Say what you do, do what you say". If it is different, one must change. Also assure that your documentation represents how you do business as well as the requirements of your contracts. Never implement a procedure from another source (including the examples in this Guideline!) without modification if it does not reflect your company's methods and your employees are not trained to execute it.

Quality Record Examples

- Master lists of current documentation revisions

meet the needs of the Fabricator's organization and its customers.

5.6.2.2 Approval

Executive Management shall approve the Quality Manual, specifically, the approval of the highest-ranking individual in the organization responsible for the facility is required at a minimum.

From the Standard:

Contract and Project Specification Review and Communication Section 6

The Fabricator shall document and implement a procedure for contract and project specification review. The review will identify, determine, plan and record the specific project requirements as well as the distribution to the responsible individuals in the Fabricator's organization. This review will consider any issue that affects the Fabricator's capability to perform the work.

The procedure must provide for review of the original contract documents, revised contract documents and changes received through clarification (e.g. requests for information or other sources) to assure that the Fabricator fully understands the contract requirements.

Evidence of contract review can take the form of technical summaries, signoffs, change orders, schedules and allocation of adequate resources. Such evidence shall indicate consideration of pertinent elements of this Standard managed by the functions listed in 5.4.1 of this Standard and other critical project require-

Section 6 Contract and Specification Review

Key Concept(s)

Review specific project requirements.

Record the review.

Assure distribution to the people who are responsible.

Interpretation

Since the Standard requires a review of contract documents when a new contract is received, it is required that you have a procedure to conduct that review. The procedure must outline who is involved with the review (by title, not the employee's name), the time period during which the review is to take place (that is, some specific time before or after the receipt of the contract, and the subjects to be reviewed. Ultimately, you decide at what point contract review begins at your company.

Normally the review will involve the plans, specifications, addenda, and any supplementary information issued, as well as any other terms and conditions that may have been agreed to including scheduling information (though the AISC Certification Program does not review the actual performance of delivery commitments or provide a judgment of facility capacities, it does ensure that the proper procedures are in place). This contract review should contain a comparison of the documents received from your customer with those stipulated in your agreement with your customer and with your proposal, including dates and revisions. While different companies will utilize different functions to undertake this portion of the review, the important process is to assure that the fabricator has all of the documents (including reference codes and standards) required by the contract.

This contract review should also discuss any technical, special, or unusual issues that are anticipated to affect the fabricators work. These are issues that, if missed, could have an adverse affect on the project, such as: special NDT requirements; special base material requirements; special grinding or other preparation work; special welding or bolting issues; special coating requirements; and any variations from your usual shop or detailing standards. The record of your review should record the details of these special considerations.

The contract review should also include information about potential subcontracted work on the project. If you intend to outsource portions of the fabrication process, include a review of your potential subcontractors' quality and ability to perform. Additionally, discuss your suppliers' ability to perform against the specific requirements of this contract.

Your procedure should also have provisions for requesting or clarifying missing or questionable information provided in the plans and specifications. The method that you would put into your procedure could vary from project-to-project and customer-to-customer, but your procedure should explain your process and provide some examples of the different approaches you prefer. The procedure should also outline a process for reviewing revisions and new material that arrives after the initial review.

It is critical that the findings of the review be communicated to those individuals in the organi-

ments that, if missed, will have a major impact on project quality. The identified specific project requirements shall be distributed to responsible personnel in the Fabricator's organization.

ization who need to be aware of this information, which means that records should at least go to the managers of the functions involved in the review—and often to others within your organization. Your procedure should state the title of the persons to receive copies.

To help achieve a consistent review, some fabricators use a checklist to summarize specific items such as: material requirements; domestic requirements; inspection requirements; NDE requirements; and coatings.

Sometimes the person in charge of contract review will delegate that work. Reviews by other departments or functions can take place separately, but there must be a way for pertinent information to be shared when it affects the execution of the contract in other parts of the company.

One useful tool is the kick-off meeting. Held shortly after the contract has been received, the kick-off meeting is an opportunity for representatives from each department to raise issues that may impact the project so that issues and potential conflicts may be readily resolved. To demonstrate compliance with the Standard, a record should be kept of the issues and recommendations resulting from the review meeting.

If the project is a simple one or is identical or extremely similar to other projects you have completed and all of the provisions contained in the plans and specifications fall within your company's standards, then your procedure for contract review may be as simple as to document that the appropriate individuals reviewed the contract documents and decided the project contained no exceptions to your company standards. In those cases, you should then inform the appropriate persons in the organization and place a copy in the project file folder.

Regardless of the similarity of projects, you must hold a project review. The review may be abbreviated due to work similar from year-to-year, with only an occasional job falling outside the norm of your usual work,

Note, however that if you decide either of these two methods are workable for your company, you must be prepared to demonstrate to the auditor that you follow them, that they are appropriate for your company, and that they work.

Tip(s)

Keep a master file of quality meetings and contract reviews for quick reference.

Quality Records

- Minutes of project kick-off meetings.
- Requests for information transmitted back to the customer.
- Cover sheets of reviews or contracts showing sign offs from the appropriate function representatives.
- Records documenting the scope of the review, such as technical summary sheets or check lists.
- Notes of special contract requirements on shop drawings.

From the Standard:

7.1 Detailing Procedures

7.1.1 Preparation of Shop Drawings and Erection Drawings

The shop and erection drawings produced must incorporate all customer requirements, specifications, codes and relevant Standards to adequately procure materials, fabricate and erect the structural steel frame. To ensure and verify this, a documented procedure for preparation of shop and erection drawings shall be developed which describe:

- How project requirements are reviewed and incorporated.
- How the Fabricator coordinates, clarifies, resolves, and tracks information with the customer (e.g., construction change documents, Requests for Information [RFI]) and how the associated resolutions are tracked and controlled).

7.1.2 Detailing Standards

The Fabricator will prepare and utilize detailing Standards describing technical preferences and requirements customarily used in the shop. These Standards will show spe-

Element 7.1.1, 7.1.2 Detailing Procedures

Key Concept(s)

Your shop drawings must clearly represent your customer's requirements, including applicable codes and specifications, and that the drawings adequately communicate those requirements.

Detailing standards must be developed and put into practice to assure uniformity in your shop and erection drawings.

Required Documentation

Describe the preparation of shop and erection drawings
Detailing Standard(s)

Interpretation

While procedures will vary from company to company, there are some basic items that need to be addressed in your written detailing procedures.

First, prior to the start of detailing, your methodology for reviewing the contract documents must be established and described in your written procedure. The review is performed by your firm's equivalent to a chief draftsman, squad leader, or detailing manager. This review includes a comparison of the company standard detailing procedures with those that may be required by the contract documents and includes issues pertaining to materials, fabrication requirements, loading, shipping, erection, non-destructive examination and any special processes. You may find that a written summary of that review made available to the individual responsible for contract review and all those doing drafting on the project, both within the company and, as appropriate, to subcontracted detailers, is an excellent way to assure that the review is effective and that all requirements are incorporated. Choose to stipulate a specific time period for the review after the detailing function receives the plans and specifications.

If warranted by the review, written documentation should be sent to the customer advising of any variations between the company's standards and the specific customer requirements.

The procedure must also contain a method to assure that changes, additions and deletions that arise during the project don't "fall between the cracks". This will require that controls be implemented to assure that these items are incorporated into the shop and erection drawings. Likewise, the procedure should include the process by which you track missing or incorrect information uncovered during your detailing that have resulted in a RFI (request for information). Again, it is critical that these items are not forgotten or misplaced.

One way these issues may be controlled is by means of logs or a similar system that also incorporates a method to follow up if responses to questions are not forthcoming within a stipulated period of time. You may create a list of outstanding issues and review them at a particular time. It may be that these items are brought up at your regular detailing meetings or regularly scheduled production meetings until such time as answers are received. Any system will work that assures that unclear, missing or incorrect issues with contract specification are resolved to protect you later at contract delivery time.

cial information required on advance bills such as allowances for cuts, camber or supplementary requirements. The Standards will include how mill order lists are prepared which, at a minimum, include: sizes, appropriate ASTM specification references, special ordering information and any allowances or tolerances.

The Standards will illustrate the Fabricator's preferred methods of drawing layout, including but not limited to views, title block information, the method of designating shipping sequences, the piece marking system, dimensional preferences, commonly used shop abbreviations, the method of showing bolt type and installation requirements, information required on weld symbols including any special NDT requirements, the preferred way to designate coating requirements

The Standards will describe the Fabricator's preferred method for the selection of geometry, connections and material (including sizes and specifications)-the preferred method for detailing holes, fasteners, washers, cuts and copes, assignment of appropriate welding symbols, shop welds, piece marks, bolt placement lists, field welds-and the preferred method for showing surface preparation (including specification of sur-

Detailing Standard(s)

In order that all of your employees, as well as those of your subcontracted detailers, are completely familiar with your detailing system, a written set of detailing standards must be prepared. Some fabricators prepare a major document of substantial length. Others may use the AISC publication *Detailing for Steel Construction* as a base and use their company standard as a supplement to that document. Others have something in between. The key is for your standard to contain instructions covering topics such as how you prepare advance bills of materials and mill orders; how you show shipping sequences; your preferred marking system; how you want dimensions shown; the style of detailing for various building components; as well as any other items that would have an effect on the detailing process.

In the detailing standards you should reference, where appropriate, the sections within industry documents that govern the item being discussed. Many of these documents are listed in the Quality Standard, Element 3. For instance, when discussing welding you will instruct your detailers to incorporate the specific applicable requirements of the AWS D1.1. This section of your detailing standard will interpret how you will incorporate and meet a D1.1 requirements. Other issues may be clarified by referencing the AISC *Code of Standard Practice*. Compliance to these two codes is required by the AISC Certification Program and most building structures contracts. Reference the specific requirements that relate to your work often in your detailing standard. This practice will assure compliance and be easier than developing your own in-house criteria completely without direct reference.

Providing clear and definitive information to the erector is a critical component to the detailing process and should be addressed in your detailing standard.

Tip(s)

There are three procedures required under element 7, one for preparation of shop and erection drawings, one for checking of these drawings and one for those furnished by your customer. These can be issued as separate procedures, or combined into one procedure.

Quality Record Examples

- RFI's and other communications with customers regarding shop drawings
- Advanced bill of materials
- Design calculations

face finish), coating materials and dry film thickness, shipping sequences and any necessary special instructions to fabricate and erect the structural steel frame.

Finally, the Standards will include necessary information required by the erector to install the members including bolt lists and any other information required by the Fabricator.