



## DOOR SPECIFICATION WRITING

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In this Tech Talk the subject of writing a door specification will be addressed. This document is not oriented only toward hollow metal or wood doors, although these door types are referenced in some of the examples used. It is intended to be useful in preparing any type of door specification.

Among the first questions a potential specification writer might ask are: "Where do I begin?" and "How do I proceed?" Remember, when writing a specification you are acting as a consultant, either to an architect or an engineer. Your goal is to write a specification that is fair to all parties involved.

The final specification is the responsibility of the architect, but as a consultant you must present the best possible specification and in a manner that is acceptable to the architect. Perhaps this is not the time to discuss whether or not a consultant should write specifications for a fee or for gratis. However, it is difficult to believe any individual who has spent a great deal of time and effort obtaining credentials would give away such expertise.

The ultimate responsibility for the design, operation and security of the building belongs to the architect. Nevertheless it is the consultant's responsibility to provide an accurate and

complete specification on which the architect will base the final decision.

How does the consultant begin? First, try to get involved in the project long before the final working drawings are completed. If you are involved in the preparation of the door schedule itself you will have a more comprehensive understanding of the total project.

Some question whether or not the consultant should be involved in the preparation of the door schedule. This writer's response would be a definite "YES!" The more involved one becomes in a project, the better the understanding of what the architect is trying to accomplish. This will simplify the task of writing a good specification.

What is a specification? The dictionary defines this as "a detailed description of the dimensions, materials, quantities, etc. for a building, road, dam, etc." Bidders learn from the specification not only information as to the nature and amount of work which they will be called on to do if their bid is accepted, but they also may form some idea of the fairness of the parties who have prepared the plans and specifications. It is self-evident, therefore, that absolute clarity is mandatory.

Any specification that is indefinite, indeterminate, ambiguous, arbitrary or unfair must be considered a poor specification. It is our belief that all specifications should be subject to a literal interpretation. Brevity is important, but all elements of the contract should be described clearly, completely and exactly. The specification should be as brief as is consistent with completeness and exactness. Remember, a specification should include only what is required on a specific project. One that includes materials and products not involved in a job is misleading, and is another example of a poorly written document.

In the preparation of a technical specification it is essential that the specification writer have a comprehensive and detailed knowledge of:

- The qualities and characteristics of the various materials to be used.
- The usual and practical methods of performing the work.
- The methods ordinarily employed by manufacturers and mechanics.

What is the best way to set up and organize a specification? Opinions will differ on this question. For example, the American Institute of Architects promotes the use of the AIA "MasterSpec" format. The Construction Specifications Institute offers the CSI Three-Part Format. This format is approved by the Technical Studies Committee of Construction Specifications Canada (CSC) and the Technical Documents Committee of the Construction Specifications Institute (CSI). It is used by many architects and engineers in the United States and Canada. It is taught in all the DHI Technical Programs and its use is required on the AHC

and CDC examinations.

For purposes of this Tech Talk the CSI Three-Part Format will be used. This format produces a uniform appearance and organization of the specification sections. Among the advantages are standardization and consistency. It provides a useful tool to assure that nothing will be omitted from a specification if the format is followed.

The three-part format is broken down as follows:

**PART 1 - GENERAL.** This part defines specific administrative and procedural requirements unique to this section.

**PART 2 - PRODUCTS.** This part describes in detail the quality of materials and products that are required to be incorporated into the project under this section.

**PART 3 - EXECUTION.** This part describes preparatory actions and how the products are to be incorporated into the project. In this portion of the specification you will cover in detail how the material described in Part 2 is to be installed and maintained.

Each part of a section is divided further into articles and paragraphs. The sequence in which the information appears should be followed. Titles are optional and should be selected carefully.

The above is a broad scope of the preparation of a door specification. Now we will examine the specific parts of each portion of the specification.



## PART 1 – GENERAL

This part is intended to include general requirements related to this section that would not be described in detail in DIVISION 1 - GENERAL REQUIREMENTS. Each item should be coordinated carefully with the applicable sections of DIVISION 1 to eliminate repetitious or conflicting requirements. The PART 1 requirements expand or supplement, but do not repeat information in DIVISION 1 of the project specification.

The first article is titled SUMMARY. The first paragraph is SECTION INCLUDES: In this section a general description of the items to be covered in the door specification can be listed. List significant generic types of products, work or requirements specified. It is not essential that all items specified be listed here. This is a representative listing of the products specified which permits the reader to assess the section quickly. Include items that are only furnished under this section but are installed under another section, as well as products that are installed under this section but are furnished under other sections of the specifications.

The next article is titled RELATED SECTIONS. A listing of related items specified elsewhere should appear here, along with the section in which they appear. This listing should be as comprehensive as possible, to ensure that all items are covered somewhere in the contract specifications.

The types of items that should be listed here are installation, finish painting, glass and glazing, finish hardware, electrical wiring, etc. Only list items that are pertinent to this particular project.

Unit prices, if required, should be covered

under this section. It should be very clear how these unit prices are to be quoted. Allowances also would be mentioned under this section, although they rarely are used in door products. If alternate quotes will be required, this fact should be mentioned here. Do not try to describe the alternates, as they will be outlined in Division 1.

REFERENCES constitutes the next article. List all references used in the specification, complete with designations and titles. When standards are referred to, they include such documents as local building codes, NFPA-80 (Fire Doors and Windows) and NFPA-101 (Life Safety Code.) Other standards that may be applicable are ANSI standards and ASTM standards. When specifying hollow metal products, standards put forth by SDI (Steel Door Institute) and NAAMM (National Association of Architectural Metal Manufacturers) are very useful. Only use standards that are applicable to a particular product being specified for this project. This article does not require compliance with standards, but merely is a listing of those used.

The next article to appear is SUBMITTALS. Here you should outline what type of shop drawings are required, and in what quantity. If the architect has special requirements such as reproducibles or sepias, it should be so noted. Perhaps full scale drawings are required, or drawings on sheets no less than 11" x 17". Many people furnish shop drawings on 8-1/2" x 11" paper so they can be reproduced on a copy machine. However many architects will not accept drawings this small.

Also, in this article define any other type of submittal which may be required. This might include physical samples, engineering data, catalogs or catalog cuts, product data sheets or

wiring diagrams.

Operation and Maintenance Manuals are needed by the owner for proper maintenance of the building. Some type of manual that lists both the manufacturer of the product and the name and address of the local supplier should be provided to the owner and this should be covered in this article. Caution: The subjects of submittals, samples and substitutions are covered in DIVISION 1. Be sure nothing written in Part 1 is in conflict with the corresponding DIVISION 1 sections.

QUALITY ASSURANCE is next. This article should include statements which provide criteria, regulatory requirements, limitations and standards which establish a minimum level of quality against which persons, manufacturers and products can be evaluated for compliance with the requirements of the project specification.

The first paragraph to consider is SUBSTITUTIONS, or, as most everyone knows it, the infamous "OR EQUAL" clause. This subject is of utmost importance, and must be given very careful consideration. Careful handling of the subject in this portion of the specification will avoid problems during the bidding process, and after the contract has been awarded. First determine the architect's and/or the owner's desires in regard to substitute products. Normally it is in the best interest of the owner to have more than one product or one manufacturer specified, so competition is not limited and competitive pricing will ensue. However, there are circumstances that well may require a proprietary specification. Normally it is done for reasons of maintenance or aesthetics. When specifying more than one manufacturer's product, be sure the products are in fact equal. Many architects like to name several products as

equal by using manufacturers' names and product numbers. This should be done in Part 2 -Products.

Some architects use the prior approval clause to determine substitutions. This requires the bidder to submit a request for substitution together with product information a specified number of days prior to the bid due date. We strongly recommend against this type of a substitution clause, because it is grossly unfair, and in some cases has been found to be illegal. In reality, very few bidders look at a job far enough in advance to make the above mentioned submittal.

The main point to remember is that it is far better to provide for the substitutions in advance rather than to be faced with the possibility of having to accept an inferior product after the contract has been awarded.

What else can be added to this section of the specification to provide "Quality Assurance?" Reference can be made to independent testing laboratories such as Underwriters' Laboratories Inc. or Warnock-Hersey Inc. If a product bears a label from one of the above organizations it indicates a product has been tested and meets certain criteria.

It should not be assumed that a material supplier has qualified personnel employed. This qualification should be established. If the company employs a Certified Door Consultant (CDC) who has passed a rigorous set of tests administered by the Door and Hardware Institute this qualification will be met. Equivalent experience and knowledge is another way to establish this qualification. The specification could include a provision that the supplier must have a certain number of years in the industry. Physical samples are a method of

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insuring a certain level of quality. Remember, however you present this part of the specification, the ultimate goal is material equal to or better than what is specified.

**DELIVERY, STORAGE AND HANDLING.** List any special packing and shipping requirements for those products, materials, equipment and components specified in the section. Mention should be made of any special marking of the product that may be required for the project. If there are special delivery requirements such as shipping one building at a time, this is the section in which to specify this requirement. Mention also should be made of site conditions for acceptance of the product. Hollow metal frames can be delivered when the site is in rather rough condition, but wood doors cannot be delivered until the building is tight and dry. Improper storage could cause severe damage to a product before it is installed.

**WARRANTY** is the next article to be considered. It is very important to consider what type of warranty is being offered, and by whom it is furnished. The statement "The manufacturer warranties or guarantees the product for a period of one year" has no real meaning unless it is established clearly when the warranty period begins. If the warranty is for a period of one year, does it begin with the day the material is shipped, the day the material is installed, or when the project is completed? Normally a warranty will go into effect upon substantial completion of the building. Substantial completion usually is defined as 90% completion. Warranties usually will be defined in Division 1. The key point is to define clearly the period of the warranty and exactly when it goes into effect.

**MAINTENANCE** is the next article and

should be divided into two sections. The first is maintenance service. List provisions for maintenance that are critical to the material involved.

Next is extra materials. List items to be furnished to the owner by the contractor for future maintenance and repair. This especially should include items that could be difficult to obtain for any number of reasons. It should be specified clearly exactly what is required, so there will be no misunderstandings after the job is completed.

## **PART 2 – PRODUCTS**

This part includes information about systems, materials, manufactured units, equipment, components and accessories. Also to be included is all pertinent information relative to the finishing of a product prior to incorporation into the project.

**MANUFACTURERS** is the first article to appear in this section. List the names of the manufacturers whose products will be used in the specifications. The names of the manufacturers should be supplemented by the addition of brand names, model numbers or other product designations. A minimum of three different manufacturers should be listed in order to encourage many bidders on the project. The worst mistake most specification writers make is to list three companies that do completely different things, and make products that are in no way equal. Select three manufacturers who make equivalent products, and also list their model numbers. Model numbers are very important because most companies make products with different levels of quality. Be sure the specification compares "apples to apples".

**MATERIALS.** In this article provide a

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detailed statement of the material to be furnished. Remember, this Tech Talk is titled Door Specification Writing. As we all know there are a great many types of doors available in the market place, and the ultimate goal is to make this Tech Talk applicable to all types of doors. Determine exactly what should be put in this article of the specification in order to define clearly the product required.

Perhaps the best way to explain the proper way to present a specification is by example. Most people are familiar with standard hollow metal doors and frames, so this product will be used as an example. Following is information that should be included in a specification for a project that requires all standard hollow metal doors and frames:

- All frames are to be — gauge — (specify gauge)
- All frames to be fabricated from — steel — (specify type of steel)
- All frames to be furnished ... (specify SUW or KD). If SUW, specify type of welding.
- All frames to have — (specify type(s) of anchors). Possibly several types are required.
- All frames to have — (special instructions); 4" heads, closer reinforcements, all frames to be furnished with silencers, etc.
- All exterior frames to be 14 gauge.
- All frames, where indicated, are to have the UL label.

- All frames are to be finished — (clearly define finish).

The idea is to include everything in the specification that is applicable to the particular job for which you are writing a specification. The importance of complete information cannot be overemphasized. Do not include something in the specification if it does not pertain to this job. For example - if the job does not contain any exterior metal frames, do not have a paragraph in the specification pertaining to exterior metal frames such as "all exterior hollow metal frames shall be fabricated from hot dipped galvanized steel etc." Not only is this extraneous, it causes confusion because a bidder starts looking for something that is not there.

The same approach must be used when writing a door specification. If we are writing a specification about hollow metal doors, we must include the same type of items as listed above. The specifications should include the following:

- Gauge of doors.
- Type of construction and core.
- Finish.
- Label requirements.
- Information about glass kits and louvers.
- Special requirements and preparation such as magnetic switches, power transfers, etc.

A specification for wood doors should include the following:

- Core material.
- Door construction.

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- Door faces - veneer grade - veneer matching.
- Finish.
- Machining.
- Special considerations (lead lining; STC; etc.)
- Label requirements.

The preparation of a specification for specialty doors follows the same principles. If metal, gauge of material must be included, and the type of material and perhaps thickness if non-metal. Always describe the type of construction to establish a level of quality. Finish and label requirements always are an important consideration. With specialty doors it must be clearly defined whether the doors are factory finished, or painted, or otherwise finished in the field. Many specialty doors, such as rolling and sliding will be furnished with some type of electric or power operator. Of course this opens up virgin territory. Carefully detail the type of operator, including the operating mechanism, such as key switches, push button stations, radio controls, smoke detectors and safety devices. The question of who does the electrical wiring and from where the wiring starts always comes into focus. This subject must be handled very carefully in order to avoid a lot of problems during construction. Most of the time the wiring is done by the electrician, but it must be so specified and coordinated with the electrical section of the contract documents. This item also should be covered in Part 1 under Related Sections. Quite often, when writing a specification for a specialty door, you can set the criteria for a product by using the manufacturer's name and

model number. Be sure you understand what you are specifying, and that you add any pertinent information that is required to complete the specification.

This format for writing a specification incorporates under the article titled MATERIALS, the following, quoted from the CSI format: "Manufactured Units, Equipment, Components, Accessories, Mixes and Fabrication." Certain products such as doors do not lend themselves to following the CSI paragraphs in their entirety.

The final article of Part 2 is SOURCE QUALITY CONTROL. If tests and inspections of products are required at the source, such as the factory, mill or shop, they should be specified here. If special reports are required, such as test data for acoustical doors, it should be so specified.

Remember, you are acting as a consultant to the architect. The architect is using you for your expertise and knowledge. If you do not agree with some of the things the architect proposes, don't be afraid to speak up and advise what you feel is incorrect or could be a potential problem. Not only will a qualified consultant have a great deal of expertise, he/she will do whatever is possible to keep abreast of the rapid changes in material and technology. This is a rapidly changing industry and it is up to the consultant to keep up with the changes. As a specification writer it is imperative that you have a great deal of knowledge about your subject before you try to prepare a specification.

## PART 3 – EXECUTION

This part involves basic on-site labor and should include provisions for incorporating products into the project. The products to be incorporated

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may be specified in Part 2, or may be furnished under other sections.

The first article is EXAMINATION. In this paragraph we physically inspect the site to verify that conditions are acceptable to receive the specified products. Remember, certain products such as prefinished wood doors cannot be delivered to the job until the building is tight and dry. In this paragraph you might want to address field dimensions. Depending on the type of project, it may be necessary to field measure every opening before any material can be ordered.

The above article is followed by PREPARATION. State what actions are necessary to physically prepare the area or site, so that the specified product can be properly installed. You must mention something about protecting the surrounding areas, so as not to cause damage to other people's work.

ERECTION - INSTALLATION - APPLICATION. This is one of the most important articles. In this section, we explain exactly what actions are required to accomplish a satisfactory installation. Remember, this could also include materials to be furnished under other sections of the specifications. If materials are to be installed according to manufacturers' instructions, it should be so noted. If we are writing a specification about hollow metal frames, we should have a statement similar to the following:

"All metal frames shall be accurately set to established lines and grades, and shall be rigidly fastened to the adjacent construction. Work shall be erected plumb and true in accordance with the best practice of the industry." The preceding statements are applicable both to welded and KD frames. If a product is not

installed properly, it obviously will not function correctly. In this article include anything that might be unique to a particular product.

The next article is FIELD QUALITY CONTROL. There must be a requirement for a final inspection of the completed work. This is when we determine if all materials were installed correctly, and function the way they were designed. If a product is of a very special nature, and requires supervision by the manufacturer, it should be so stated. Some materials must be tested after they are installed. For example, a lead lined door and frame unit, or a sound retarding door and frame must be field tested after installation to ensure compliance. Any electrically operated door, such as a rolling steel door, must be tested after it is wired. This will ensure that the door is functioning properly, that all the controls work, and that the limit switches have been set.

ADJUSTING AND CLEANING is the next article to be discussed. All material furnished under this section should be checked and adjusted for proper operation. Doors should be reviewed to ensure proper alignment, and all hardware should have final adjustments made. Any material found to be defective must be replaced. Doors and frames should be cleaned and left in a finished condition for painting by others. Also mention repairing damage to adjacent work caused by the work of this section.

DEMONSTRATION. State any requirements of the installer or manufacturer to demonstrate the operation and maintenance of the product or equipment installed. For example, if the specification is about some type of motorized door, the owner must be educated on how all the controls work and what procedures to take if electric power is lost. If the product



installed is some type of vault door, the owner must be fully informed on the workings of all the mechanisms. If operating and/or maintenance manuals are available, they should be furnished complete to the owner.

Let's talk about PROTECTION. List any and all provisions that are necessary to protect the installed material prior to final acceptance by the architect and the owner. Prefinished products such as wood doors must be carefully protected while construction is being finished. We might specify that all prefinished doors are to be left in their factory packaging until final completion. This paragraph is quite important because all too often careless workmen damage finished products. Clean-up could also be covered in this article, because if a lot of debris is left around there is more opportunity for damage.

The last article of Part 3 is SCHEDULES. Schedules technically are not part of Execution, but they are placed at this point in the specification for convenience. It is very important that the specifications require that the owner receive at least one copy of all final shop drawings and schedules. These drawings should be what we refer to as "AS BUILT" drawings, which means they have been updated to incorporate all revisions. All too often an owner is left with a new building, and not much else. The owner is done a grave injustice if he/she is not provided with a comprehensive set of drawings, schedules and maintenance manuals. This material obviously is required for reasons of maintenance and operation. Remember, you can never furnish an owner too much information.

## SUMMARY

If you have digested all of the above you now are ready to write a proper and acceptable door specification.

Following the CSI Three-Part Format:

1. Divide your specification into three parts:

GENERAL

PRODUCTS

EXECUTION

2. Always write all three parts of the specification.

3. Always write a specification for a particular project. Include only items that are pertinent to this project. A specification is not the place to flaunt your knowledge, or your command of the English language.

4. Be as brief as possible, but also be clear and concise.

5. Do not just copy a prepared specification. Be sure you fully comprehend exactly what you are writing.

6. Remember, you are acting as a consultant to the architect, and the final decision is up to the architect, but he is depending on you for your expertise.

7. In conclusion: Become very familiar with the project, follow the CSI three-part format, and write a specification that fully and completely describes a particular project.

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## CONCLUSION

Earlier in this Tech Talk, it was suggested that perhaps the consultant should also prepare the door schedule. I strongly believe that this should be the scenario, because then it is up to one person to coordinate the material shown on the plans with the specification. Our ultimate goal should be for the dual certified AHC/CDC to prepare the hardware schedule and specification, and the door schedule and specification. While this idea may be somewhat in the future, in time this will be standard practice. Think about it, it certainly makes a great deal of sense.

*(The author wishes to acknowledge that, with permission of the Door and Hardware Institute, great liberties were taken with the Tech Talk Hardware Specification Writing by William B. McAuliffe, DAHC/CDC. Acknowledgement also is extended concerning the use of the CSI Section Format.)*



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