

Drawing Notations: Tying Specs to Drawings

By Ronald L. Geren, AIA, CSI, CCS, CCCA, SCIP

It is an element of a set of drawings that should be the easiest to accomplish, but design professional after design professional makes the task of noting drawings more involved than it needs to be. Since the advent of computer-aided drafting (CAD), it has become much easier to add notes to drawings; therefore, design professionals have a tendency to stuff as much information into a note as can fit in the available space. However, like laundry soap, more is not always better.

Before the introduction of CAD, drawing notes were either handwritten directly on a drawing, typed or copied onto a sheet of sticky-back material and adhered to the drawing, or both—methods that took a considerable length of time to accomplish. Because of the time issue, design professionals kept notations to the minimum practicable, which meant that only the notes the design professional considered most critical to convey the design intent were added to a drawing. This doesn't mean that every note added to a drawing prior to the CAD era was appropriate or correct; however, it does mean that more thought went into the content of a note, to keep it as short as possible.

Another advantage that CAD brought to drawing notations over the antiquated handwritten process was the ease of making corrections. With handwritten notes, a correction often meant erasing and rewriting—sometimes in multiple locations just for a single correction—resulting in sloppy-looking drawings if done to excess. CAD allows for cleaner drawings, since corrections are made electronically, and the “find and replace” feature of the software allows multiple corrections with a minimal number of keystrokes.

Because it is easier to add content to drawings with little effort, design professionals may not stop to consider what they are adding to their drawings. In many cases, the information added to a drawing crosses the line that divides drawing information from specification information. A common reason for this transgression is a lack of understanding of what information is provided in the specifications. Since the drawings and specifica-

tions are complementary under standard American Institute of Architects (AIA) contract documents, adding duplicate information in the drawings and specifications does not ensure contractor conformance to the contract, but it could lead to contradictory information that may be the basis of requests for information/interpretation (RFIs) and contract modifications.

According to Module 7 “Notations” of the *Uniform Drawing System* (UDS), which is a part of the *U.S. National CAD Standard* (NCS), “Drawings convey design intent and may show multiple views, either of the whole project or its parts”; whereas,

Specifications provide detailed information and instructions concerning the project by setting requirements for the physical qualities, chemical properties, performance requirements, and standards of workmanship associated with the manufacture and installation of systems, assemblies, and components.

In essence, the drawings should show the location, size, dimension, shape, and identification of building elements. It is the final item on that list in which drawing notations play an important role.

There are several different types of notes used on drawings and each type provides a specific form of information. Each of the types described below is explained in greater detail in Module 7 of the NCS-UDS.

GENERAL NOTES

General Notes are probably the most commonly abused type of note. Their purpose is to provide information applicable to the entire set of construction *drawings*. Unfortunately, however, they are typically written to establish requirements that are not drawing related and are more appropriately covered in the specification sections of Division 01, General Requirements. Therefore, coordination between General Notes and specifications is important.

General Notes should be located on the G-series drawings; however, each discipline may have their own General Notes located in the 0-numbered sheets (the first sheet or set of sheets) for each discipline set. These should be titled as “General [Discipline] Notes,” where “[Discipline]” is replaced by the specific design professional's discipline (e.g. civil, structural, mechanical,

electrical, etc.) For example, general notes applicable to the civil engineer's drawings would be listed under the heading of "General Civil Notes."

Another form of general note is the General Sheet Note. General Sheet Notes provide information applicable to the sheet in which the general notes are located. These notes should not repeat notes used as General Notes. An example of a General Sheet Note on a plan drawing would be the following:

DIMENSIONS WHERE SHOWN ARE TO FACE OF CONCRETE, MASONRY, OR STUD

REFERENCE KEYNOTES

Reference Keynotes, or "keynotes," are the single most important element of construction drawings that tie the drawings to the specifications. Keynotes identify materials and products on the drawings and, by looking at the keynotes, the reader should be able to determine where to find the requirements in the specifications. Any lack of coordination between the keynotes and the specifications could lead to RFIs or, even worse, change orders.

Prior to keynotes, each item on a drawing was individually identified with a note. Depending on the complexity of the drawing, notations would either overpower the drawing, or because of having to hand-letter each note, notations were kept to an extreme minimum, annotating only those items determined to be essential.

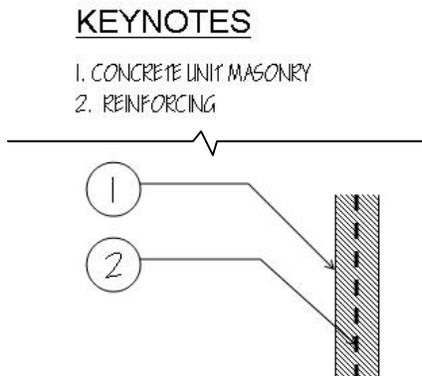


Figure 1 - A commonly used Reference Keynote format.

To simplify the notation process, notes were written only once and given a numeric identifier in a sequential list of items. The identifier, along with an arrow called a

leader, would point to an item wherever it occurred on the drawing (See Figure 1); thus the keynote was born. Although the use of keynotes cleaned up construction drawings considerably, there were a couple of drawbacks with the new method:

1. *The sequentially numbered keynote list was not the same on each sheet.* For example, Note 8 on one sheet may not be the same Note 8 on another sheet. This could cause confusion if the keynote list was not closely reviewed by the reader. A master keynote list could be created, but for large projects this would generate a list so long it could not be reproduced on each sheet.
2. *The keynote list still relied solely on terminology to tie specifications to the drawings.* Inconsistent terminology use could lead to confusion or possibly even the installation of the wrong material in the wrong location. For example, let us assume a project manual includes specification requirements for "waterproofing" and "water-resistive barrier" materials. Without understanding the difference[†], a designer may note "waterproofing" at an above-grade exterior wall when a "water-resistive barrier" should have been noted.

To overcome these drawbacks, keynotes were separated by some A/E offices into one of the 16 Divisions established by earlier editions of the Construction Specifications Institute's (CSI) MasterFormat (See Figure 2).

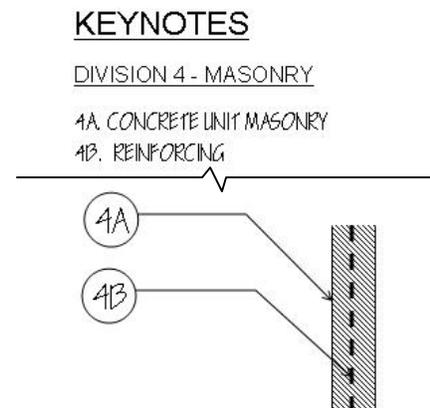


Figure 2 - Reference Keynotes based on earlier editions of CSI's MasterFormat.

[†] See Keynotes No. 1 - *Do You Really Need Waterproofing?* (Fall 2009)

This resolved, to some extent, the two drawbacks described above. The use of specification divisions to separate the keynotes helped to narrow the focus to a particular division of the specifications; and it eliminated the sequential list of all keynotes or the use of the same keynote number for different items on different drawing sheets.

To improve the coordination between drawings and specifications, a keynoting system using numbers based on CSI's MasterFormat can further direct the drawing's reader to specific sections within the project manual. This approach uses the specification section number where the item noted is specified. Following the section number and separated by a decimal point, a unique, three-character, alphanumeric suffix is added to identify the item (See Figure 3).

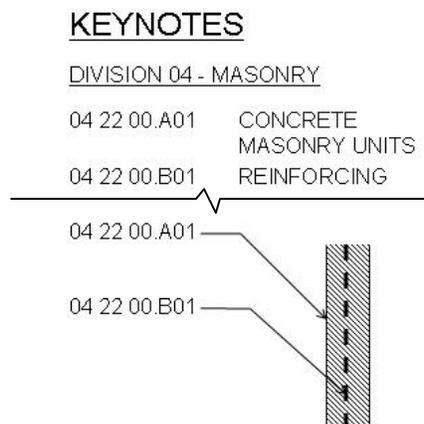


Figure 3 - Improved keynoting using current edition of CSI's MasterFormat.

As an option to the keynote system described above, the same method can be used, except that the description is provided along with the identifier (See Figure 4). This still ties the drawing item to the specification, but eliminates the need to provide a separate list.

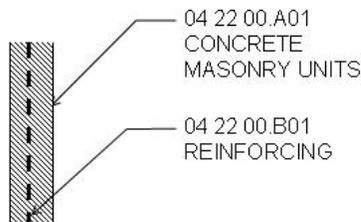


Figure 4 - Notations using both the CSI MasterFormat number and a brief description.

Regardless of the type of keynoting system implemented, the descriptive text for a drawing item should be generic and should incorporate the same terminology used in the specifications. It is important to emphasize, as mentioned earlier, that drawing notations only *identify* building elements, and a note's descriptive text should not be a lengthy narrative that describes in detail an element's characteristics and method of installation. For example, instead of this note:

FULLY-ADHERED, REINFORCED PVC ROOFING MEMBRANE WITH FELT BACKING

Use this note:

07 54 19.A01 MEMBRANE ROOFING

As you have probably noticed, the latter note is generic and is void of detailed information regarding the roofing membrane. The use of number 07 54 19 would point the reader to the specification section on "Polyvinyl-Chloride Roofing." Within PART 2 of the specification section, there will be requirements that indicate that the membrane is reinforced and has a felt backing. Also, within PART 3, the specification will provide the requirements for an adhered installation.

The benefit of this type of notation is in situations where a change is made to the noted building element. For example, if it was later decided to change from an adhered membrane to a mechanically fastened one, then in the case of the former example, every note would have to be changed, whereas the latter note needs no modification at all.

There may be times when different types of the same building element are used. For example, a building may have metal wall panels that include a flush panel type and a narrow reveal-joint type. Therefore to differentiate the two types on the drawings, two keynotes could be used with different designations, as follows:

07 42 13.A11 METAL WALL PANEL (MWP-1)

07 42 13.A12 METAL WALL PANEL (MWP-2)

To make the notes above work, the metal wall panel specification section will need to associate the proper panel with its corresponding designation. Like the membrane roofing example earlier, if metal wall panel type MWP-2 is changed to a wide reveal-joint type, there is no need to change the notations on the drawings.

SHEET KEYNOTES

The final type of notation is the Sheet Keynote. The Sheet Keynote is an informational note that identifies an important element of a drawing or provides instructional information, but has no connection to the specifications. For example, a note may identify a dashed line and provide the following description:

LINE OF FLOOR OPENING ABOVE

Or, a note may provide direction on the installation, such as the following:

ALIGN FACE OF NEW WALL WITH FACE OF EXISTING WALL

Sheet Keynotes follow a format similar to the old keynote format shown in Figure 1. However, the NCS-UDS recommends the use of a hexagon in lieu of a circle.

CONCLUSION

Architectural drawings must be coordinated not only with the input from the structural, mechanical, electrical and other consultants, but also with the person preparing the specifications. Developing a project keynote list early in the development of the construction drawings, and having it reviewed by the specifier, will minimize coordination issues later in the document preparation process. Additionally, this early coordination will get the specifier integrated into the project sooner rather than later when the drawings are nearing completion and most of the notations are already on the drawings.

Notations are an essential part of the construction drawings. The graphical aspect of drawings would convey very little to the reader unless there is some text to explain what the drawings represent. However, notations should be succinct and limited in content to essential information to avoid redundancy with the specifications.

To comment on this article, suggest other topics, or submit a question regarding specifications or construction documents in general, contact the author at ron@specsandcodes.com.

About the Author: Ronald L. Geren, AIA, CSI, CCS, CCCA, SCIP, is a Certified Construction Specifier, and

is the principal of RLGA Technical Services located in Scottsdale, Arizona, which provides specifications and code consulting services to architects, engineers, owners, and product manufacturers. A 1984 graduate of the University of Arizona, Ron has over 26 years of experience with military, public, and private agencies.