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# Standards for Developing Standards: A How-to for Busy CAD Managers

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## Learning Objectives

- Learn to identify who should develop a CAD standard, how to develop a standard, and what to do to deploy it
- Discover major milestones necessary to develop your own 10 release of your CAD standard, and then track subsequent versions
- Learn how to bring important stakeholders into the development process to gain input, buy-in, and added vetting assistance
- Learn how to identify and avoid the major pitfalls of development, deployment, implementation, and maintenance of valuable CAD standards

## Description

CAD standards matter. We are aware of this. Yet so few of us have taken the time to develop, document, and deploy the CAD standards we desperately need. We have the best intentions—we say we will "get to it when things slow down." But it just doesn't happen. The reason is simple—developing CAD standards is hard work. Never fear. We are going to outline the entire process of installing CAD standards in your company. This class will show you the way, including knowing when it's right for you to create standards, identifying which standards are needed, and deploying your new CAD standards. Learn tried-and-true steps that everyone can put to use, regardless of how busy they are. Get supportive milestone information, a checklist to help you go home and document your own effective practices, and prototype standards guides to help you start. This is the class you've been waiting for. Not another day should go by without you and your staff having excellent CAD standards at your fingertips. This session features AutoCAD, Inventor Professional, and Revit. AIA Approved

## Your AU Expert(s)

Curt Moreno is the owner and editor of Kung Fu Drafter, a blog that is CAD-centric and geek peripheral. He is an active freelance content creator for clients such as the Autodesk, Inc.; Hewlett-Packard Company; and other corporations, large and small. He is also a contributing editor to Cadalyst magazine as member of the board of directors for Autodesk User Group International (AUGI), and he's a highly rated Autodesk University speaker. He has written and spoken on topics revolving around the CAD profession, management issues, presentation topics, and customer relations for the past 6 years, and he hopes to broaden his reach. Moreno currently lives in Houston where he is the CAD coordinator for a Texas-based engineering firm. He is a public speaker and trainer, and enjoys spending time with his dog and horses. Visit his blog at [www.kungfudrafter.com](http://www.kungfudrafter.com), follow him on Twitter at @WKFD, or search for him on Google+.



## Introduction

This course is intended for the busy CAD managers, coordinators, and office leaders who are responsible for creating and curating the design standards needed to facilitate the efficient production of designs. Incorporating the following information, professionals in both large and small organizations will learn the techniques necessary for developing their own production CAD standards.

The goal of this session is to give you the skills to confidentially create a full set of CAD standards and help your team of CAD professionals be their best.

## The Importance of CAD Standards

In today's modern CAD industry there is a preponderance of voices crying out for standardization. While some advocate CAD standards on an industry-wide basis, others are in favor of localized organization-oriented standards. Regardless of the preferred direction, there is nearly universal agreement that CAD standards are a necessary step for any organization employing CAD professionals.

There are plenty of strong reasons to support the creation of CAD standards in any organization, regardless of the scale. Different people may cite different benefits, but to my mind they all boil down to two essential factors: Efficiency and Continuity.

### Efficiency

One of the most essential benefits of employing CAD standards is simple "efficiency." Not only in the sense that properly created and deployed CAD standards speed production. Efficiency is not the result of any single aspect of production. Rather it is the end result of the total sum of the production process. As such, creating efficiencies in any single portion of production will benefit the entire process.

CAD standards will, of course, have the immediate effect of speeding up production while also reducing errors. Those are two obvious effects. Somewhat less obvious examples of the gained efficiencies include reduced training costs for new employees, expanding production roles to less-experienced staff, and reducing quality control efforts. Naturally, the benefits of efficiency are not limited to these few examples. Rather, the benefits are seemingly endless since "time is money" and efficiencies create time.

### Consistency

Another essential benefit of employing CAD standards in your organization is "consistency." Consistency shows its pluses in more ways than just making sure that plan sheets all look alike. Consistency is a helpful trait of any organization that carries just as far as "efficiency" in terms of reach.

Consistency is more than the simple result of having sheets that all "look alike." A continuity of presentation is, of course, a necessary tool for any design firm. This continuity creates an elevated appearance of professionalism and instills confidence in clients. In short, consistency is a more than simply identical sheets, it is both a marketing tool and a way of ensuring that your firm's work carries on today and for years to come.

## Who Should Develop CAD Standards?

A very common question that arises around the topic of CAD standards is "Who should develop CAD standards?" It is a deceptively complex question, but the answer can be surprisingly simple: Everyone who does CAD work should employ CAD standards. Like any generalization, this statement deserves some fleshing out to be useful.



For our purposes, we will make the following statement:

“Any organization, large or small, employing any number of CAD professionals producing production designs or plan sets will benefit from CAD standards.”

This is true from the largest civil engineering, architectural, or other design firm down to the smallest of independent contractors, working alone. Codifying the processes by which production plans are created and building standardized libraries of assets will increase of efficiency and consistency in short order.

### What Are CAD Standards

Now that we have determined what benefits CAD standards can bring to an organization and that all organizations can benefit from CAD standards, it is time to determine precisely what the concept of “CAD standards” means to any organization, in particular.

It is very difficult to overstate the importance of this exercise since simply stating “We need CAD standards” is not enough. The truth is that the term “CAD standards” is an umbrella concept that can encompass any number of specific facets such as:

- Uniform layering configurations
- Documented production processes
- Standardized detail block assets
- Universal file naming conventions

All of the above, and more, are valid ideas for inclusion in your organization’s new CAD standards. Which items are included, and at what stage of development, is best determined by each individual organization. We will discuss the process of selecting the components of new CAD standards later in this document. For now, let’s assume that your new standards will consist of the bare minimum of the four items listed above.

### **The Stages of CAD Standard Development**

Too many organizations fail at their attempts to develop and implement CAD standards for one very simple reason: They believe that the development of CAD standards is purely a CAD exercise. This type of thinking drives efforts to be completely focused on the drawing and ignores too many important aspects.

For this one reason, I believe that the development of any CAD standard should be viewed in three stages:

- Meta stage
- Development stage
- Execution stage

Clearly delineating the development of CAD standards in these three stages serves to not only ensure that proper attention is paid to each of these necessary aspect, but also to create natural milestones for measuring progress.

This conceptual framework is applicable to the development of any CAD standard and can easily be adapted to suit almost any type of project in general.

## The Meta Stage

There is a certain amount of work that has to be done before the work of creating a CAD standard can happen. You can think of this as the “meta-work” since it is the work that largely facilitates the actual work of creating your standard. In the Meta Stage you will largely be concerned with answering the question of “Who” in many different ways.

The bad news is that this stage of development will not actually produce any employable version of a CAD standard. Instead it sets the foundation on which your standard will later be built.

The good, actually great, news is that this stage is largely a one-time only effort! Even as you create your organization’s CAD standard in specific categories, or “modules,” this foundation will hold strong. Even a complete change of directions, for example moving from the creation of civil engineering standards to architectural standards, should not require a total restart of the Meta Stage.

## The “Who(s)”

Before we can begin to think about WHAT your CAD standard will look like, we have to examine the most important question of “WHO will create the CAD standard”? This might seem like a simple and obvious matter, but anyone who works in even a moderately-sized organization can tell you that a good idea is not enough. There must be a person, or persons, who accept ownership and responsibility for this effort. So who should that be?

Some medium and large organizations have already answered this question by employing staff members with the responsibility, and hopefully a title, of “CAD Coordinator” or “Director of CAD Operations.” If this is the case, then this individual most likely has the creation and maintenance of CAD standards already built into their job duties.

For smaller organization, or those that simply do not have these positions, there is no reason to fret. This may be a perfect time to create just such a position and elevate an experienced CAD manager or staff member. New positions are wonderfully clean slates and natural demarcations for new directions to be taken.

It’s natural to assume that the most “experienced” CAD staff member is the best candidate to create your new standard. However, I recommend the looking for the following two characteristics when choosing a person to take on the responsibility of creating these new CAD standards:

- **Management Aptitude** – Creating a new CAD standard is a large-scale project that requires research, attention to detail, and the ability to work with others. For these reasons the ideal candidate should show an aptitude for data management and organization
- **Adaptability** – Creating a new CAD standard is literally about change. This includes obvious changes to the way CAD production staff works, but also may require changes in the way your chosen leader thinks. Therefore, adaptability is a must!
- **Enthusiasm** – Creating a new CAD standard is not fun. It is complicated work that will have setbacks and unexpected issues along the way. To overcome these negatives, the person selected to develop the standard must have a genuine enthusiasm and excitement to see the project through difficult times to completion



One final note on who should be responsible for the creation of a CAD standard, avoid committees! It is a natural instinct to assume that a committee of experienced CAD staff and management will create a better standard in a shorter time. Unfortunately, this is often not the case and, in fact, can be the root of failure.

Many psychological studies have shown that “committees” are not the ideal way to create a reasonable result without inefficiencies. Not only do people tend to “work less” in committees they have the built-in facilitator of not having individual responsibility. “The committee failed to deploy a usable standard” is a very different thing from “Mark has failed to create a usable standard.” One is the topic of mild complaint, the other is an actionable item for review.

This is not to say that any one person should have total control of a CAD standard, far from it. However, I will predict poor results for any organization trying to create a CAD standard who does not identify a single responsible person. Ownership is a powerful thing. It is also a weighty matter for anyone who is asked to take it on if it is outside their current job description. Again, this is another perfect reason to appoint a “CAD Coordinator” if your organization does not already have one.

## **The “Supports”**

Ownership in creating a new CAD standard is one key aspect of successfully creating a standard for your organization, but one tree does not make a forest. So your coordinator will need help in the form of input and support from other members of your CAD and management staff in order to succeed.

Obviously for any standard to be successful it will require the support of your organization’s management. This stakeholder buy-in is very important to identify a proper direction for the standard to take and to assure its adoption. Therefore, senior members of management should be named to supply oversight and ratification for the coordinator at specified stages of development. Without the involvement of management, the result could be a completely unusable standard and a complete loss of invested development time and effort.

Much like senior management, which can be thought of as “high on the org chart,” CAD leaders who are “lower” on the chart should also be included. Rather than approving or justifying the direction and development of the standard, these staff members are integral voices in the development process. The coordinator should rely on these people for suggestions, detailing existing work processes, and keeping the development grounded in real-world possibilities. Without the input of CAD managers and experienced production staff the new CAD standard could be “theoretically” great, but useless in actual application!

## **The Existing Standard**

Very soon in the process of creating a new CAD standard the coordinator has to examine whether or not the organization has a CAD standard that is already in place. If there is already a defined collection of practices and guidelines in place that is fantastic! This single fact completely transforms the efforts from “creating” a CAD standard to “updating” a CAD standard. No reinventing the wheel for your coordinator! Simply review the standard, section by section, examining its applicability in modern production work and update as needed.

However, the real trick comes when there is no defined collection of practices and guidelines in place. Rather than assume this means that there is “no standard” time must be taken to determine if there is an “assumed” standard. This sort of standard is better known as “the way we do it.”

Every CAD production room has certain ways that they work. These small details lie in layer colors, plotting habits, and even highlighting redlines. Each of these miniscule habits that



production CAD staff pass on from one to another comprise a de facto standard. It may not be documented, but it is very much alive and well and the smart coordinator will do well to not ignore it! Instead, effort must be made to work with CAD leaders and identify these habits and document, as well as possibly improve, them for inclusion in an approved organizational CAD standard!

All of the above comprise the Meta Stage of developing successful CAD standards. It is largely about the “Who” of the creation process. But, as you can see, it also can play a pivotal role in determining the all-important “What” of the direction that your coordinator takes in the development of your organization’s CAD standard.

By the end of the Meta Stage you should have established the following:

- Who is responsible for the CAD standard (the coordinator)
- Who will review and approve the CAD standard (the management)
- Who will help develop the CAD standard (the CAD leaders)
- Where your coordinator will begin with the documentation process

These meta-stage steps are applicable to nearly any form of standards development and will benefit those creating standards for civil, architectural, mechanical, or any other discipline organization. Even in large firms, comprised of multiple disciplines, the work done in the Meta Stage can be reapplied, or at the very least, is partially applicable as the coordinator pivots from discipline to discipline.

## **Start at the Beginning**

With the Meta Stage behind us, the time has come to begin focus on creating the actual CAD standard that is the goal of your organization. It may seem like an obvious thing to say “We begin at the beginning,” but exactly where is “the beginning”? Some firms feel that CAD standards rest entirely on the integrity of the DWG and therefore “the beginning” is a point in the drawing. Other believe that a valid standard revolves around the proper application of company processes and therefore work should start with a collection of Best Practice documents.

While both of these approaches are valid, I feel there are only one logical way to begin at “the beginning” and it is not in the drawing or in best practice documents. I believe that the beginning is a point that can only be identified by communicating with a firm’s CAD leaders.

### **Ask the Tough Questions**

Taking time in the beginning to meet with as many available leaders of a firm’s CAD staff is a fantastic starting point for your CAD standard creation efforts. However, while it may be instinctive to meet and discuss the new standard, I recommend these initial meetings revolve around current efforts. Specifically, I think that only by having open communications with CAD leaders can you properly identify the pain points of the current CAD production process. You must meet with the people doing the work to find out what does not work.

Once you have met with the full range of available CAD leaders in your firm and identified a wide collection of pain points you have the beginnings of a road map to your new CAD standard. These are the high points that require immediate, or added, attention in the creation process.

Distilling this information will allow you to identify the single greatest pain point that is hindering production for your CAD staff. This is an ideal point to refer to as “the beginning.” But, just a bit more reflection is required before you can begin work.



## What is Beneath “the Beginning”?

For the sake of this example let's set a hypothetical situation in which you have determined that a common difficulty in your firm is time wasted due to plots with incorrect lineweights. You may have decided that the starting point for your CAD standard is the following:

“Standardize plot styles and practices to produce identical plan set plots.”

While this is a very valid thought, you must take a moment to think whether or not plot styles are in fact the cause of lost time. In researching DWG files, you may learn that the actual cause has nothing to do with plot styles, but rather with the colors associated with entities. This could lead to the secondary assumption that “layering standards” are an ideal starting point. However, further examination of several representative projects could determine that while layer configurations are consistent with an existing drawing template, your CAD staff has been modifying individual entities to change the color “by object” rather than “by layer.” This revelation points to an entirely different starting point for your standard, that being a “best practice” issue.

This single example is just one way in which research, reflection, and further examination is absolutely necessary in order to best determine the actual cause of an inefficiency.

Considering the myriad of aspects that could comprise your new CAD standard, it quickly becomes obvious that this communication and examination is essential to the return on investment in the development process. Without this initial hashing and analysis, it is incredibly easy to become derailed and focus effort, and costs, on areas of a CAD standard that will yield reduced, or ineffective, results.

Take the time to properly identify the areas of your new standard that will yield the greatest impact in the shortest amount of time!

## The First Milestone

If you have completed the steps of the Meta Stage and also properly identified your first pain point of production, then you are at a very enviable stage where you can confidently report to your management, or supporters, the following:

- A full listing of management stakeholders who will oversee what aspects of the new standard
- A wide list of areas that require focus in the development of your standard
- A general breakdown, or roadmap, of how your standard will be developed so initial efforts have the greatest impact
- The area identified as the cause of the greatest hindrance to CAD production

This report to your stakeholders marks your first milestone and cements the effort to properly begin the process of creating a new CAD standard for your organization. It is also a major step in building confidence in your stakeholders that the efforts to develop a new standard are not aimless or misguided.

Once apprised of your progress, your stakeholders may have input to add. Once everyone aware of the direction the work is going, it is time to move on.



## Beyond the Beginning

Due to the nearly endless aspects of CAD work, and therefore CAD standards, it would be impossible to identify ALL the possible directions that a new CAD standard can go. The possibilities are almost infinite. In addition, I feel that any person selected as the coordinator of an organization's standard should have extensive CAD experience from which they can draw on to know the minutia making changes such as layer color in order to set up an ideal drawing.

That being said, there is no reason that a helpful (but by no means "complete") list of possible items to include might not be helpful! The follow is a list of the most common items included in general CAD standards and therefore will probably show up on your roadmap to a new standard:

- **File Structure** – Too many organizations do not take the structure and integrity of their data seriously enough. A standard file structure for CAD drawings that categorizes existing, proposed, survey, and record drawing files is essential. This reduces the time it takes to find needed files. This is especially true after long periods of time pass between project phases.
- **File Naming Standard** – A standard convention for CAD naming is essentially to easily and confidently identify drawings in large drawing sets. Mistakenly opened drawings files require rendering time to initially "open," and that time does add up! Remember, time is money!
- **Layering Standard** – Layering is essential to drawing files, both large and small. Establishing conventions for nomenclature, color, and visibility are just a few ways to create a standard that can be relied on throughout your organization. And do not forget the layer descriptions!
- **Annotation Standard** – Codifying the specifics of text in drawings is essential to the continuity of a plan set. Plan sheets with varied font styles, orientations, colors, dimension styles, and leader callouts rob your organization of the professional impression it deserves!
- **External Reference Standard** – While external references and data shortcuts can be huge timesavers, improperly applying them could cause issues. The most common issue being "circular references" in which external references have multiple, nested, entries in a single drawing file. Establishing a best practice of inserting external references as "overlay" objects is a quick and reliable fix.
- **Plot Standard** – No matter how detailed and thorough a drawing file may be, until it is shared with building or manufacturing professionals it is just so many lines on a screen. Since most plan sets are still shared in print, it is very important that any organization have a single or standardized set of plot files that can be relied on to accurately produce reliable and prints with accurate lineweights and colors.

Again, this is by no means a complete list. Nor is it a detailed direction of "how to change layer colors" or other minutia. The wealth and depth of information on the internet and in resources available for purchase more than covers those deep, detail needs. As short list of recommended resources for this type of information I suggest you visit the following sites:

- [YouTube.com](https://www.youtube.com)
- [Cadapult-Software.com](https://www.cadapult-software.com)
- [Vimeo.com](https://www.vimeo.com)
- [GlobaleTraining.ca](https://www.globaletraining.ca)
- [CAD-Notes.com](https://www.cad-notes.com)

For further resources feel free to visit the blogs section of Kung Fu Drafter. And, of course, there is always Google.

## The Shape of Standards

Since a CAD standard has a variety of aspects that require attention and different approaches, it only makes sense that the standard itself would be comprised of various forms of documentation. These can take several forms that include:

- **Drawing Templates** – “Seed” files that are used to set initial, standardized configurations, of CAD drawings that speed production
- **Best Practice Documents** – Written documents that catalog and detail an organization’s approved method for CAD production
- **Detail Libraries** – Standardized, reusable CAD drawings that represent water, paving, structural, and other design details that are used across multiple projects for greater design information

### Drawing Templates

Drawing templates are CAD drawing files that end in the file extension “DWT” and are used to store preferred settings for DWG files. When beginning a new DWG file, a template can be selected as a “seed” that AutoCAD and other CAD products will use to create a new file with all of the DWTs pre-defined aspects. These can include layer standards, plot configurations, annotation styles, and many other details.

Obviously this can be a great time saver, but more importantly it creates a method of standardizing these drawing features with little to no effort. Therefore, DWT files are essential for inclusion in any CAD standard.

As fantastically helpful as the DWT file can be, it does not have to be difficult to create. The process is as simple as taking a drawing based on the existing DWT in use, making the desired changes, and saving the file as a “Drawing Template” for future use.

Once created, drawing templates should be stored in a designated location accessible to all production CAD staff. This highlights the importance of document file locations and file structures so all involved parties can be confident that they can find the needed template. A template that can’t be found won’t be used!

### Best Practice Documents

Along with drawing templates, best practice documents are essential to the successful creation of any CAD standard. It is not enough to “set things up” if you do not properly document the steps involved in the approved production process for an organization.

Essentially, a “best practice” is a well-thought-out “How to” document. It should take a single process and distill it into the individual steps required to take the selected task from beginning to end.

Best practice documentation can take the form of something as simple as a bullet list of steps, consisting of just a few words each. However, truly effective documents will present a single task in a way that explains not only the steps involved in the process, but also its concepts. In addition, the process information should be presented in a manner that is equally useful for both novice and experienced production staff.

The best practice example presents a sample document that has sections that explain the concept, the step-by-step process, a checklist, and a workflow diagram. While more effort is required for this type of approach, such a document is universally applicable for both new and experienced users. The result is that, when correctly, a best practice document should only

have to be created once, then maintained routinely. The cost savings should be obvious to anyone questioning time spent creating these assets.

### Detail Libraries

Standardized detail libraries, in addition to drawing templates and best practice documents, are key to the success of any nascent CAD standard. This single, simple innovation in your production practice can yield a massive return on investment in terms of wasted billable hours, resulting in increased effectiveness for your team.

The reason it is necessary to create a standardized detail library which is, in turn, made available to all production staff is a matter of multiplication, rather than simplification. If a company has even the simplest detail, for example a fire hydrant, and has 10 offices then there is a strong likelihood of duplicated effort. Why would anyone reinvent the wheel, let alone do it 10 times? Even if the duplicated effort were assumed to be half, that is still 4x the additional billable hours to recreate a single detail.

Now multiply that wasted time by the number of details in any given design firm. The scope of wasted time quickly becomes staggering. Still, the waste does not end there. The practice of maintaining multiple instances of detail drawings creates an ecosystem that all but guarantees errors in maintenance. Multiple instances of details that differ from one another are not very standard.

Standardizing the full set of details across all office locations is the only sure way to put an end to all of this waste.

As with most aspects of any CAD standard, the exact details of how you choose to organize the detail library for your organization will vary. However, there are some basic steps involved with standardizing any existing collection of CAD details:

1. Collect all multiple instances of existing details
  - a. Review the full collection and select the best, most suitable file
2. Check the linework
  - a. Eliminate duplicate linework
  - b. Convert connected lines into single polylines
  - c. Check hatches
3. Check the text
  - a. Check font styles and sizes
  - b. Convert all existing text to Mtext and spell check
  - c. Check all callouts and dimensions for accuracy
  - d. Verify layering
  - e. Verify justification
4. Check the layers
  - a. Reduce existing layers to bare minimum
  - b. Normalize layer settings and nomenclature
  - c. Enter layer descriptions
5. Check the detail's insertion point

By following the above checklist, you can quickly reduce the intimidation factor of such a daunting task. Soon you will have a collection of similarly formatted detail drawings that will work in your projects.



As a final tip, examine the physical size of the detail in relation to the intended sheet size and adjust the size accordingly to insure it will fit with the standard border in use. Also, I deeply recommend a separate title block with a detail grid to avoid cluttered detail sheets. This grid should have standardized spacing for details and all details should be set to fit into 1 or more grid spaces, but never more than one detail per space.

## Deploying the CAD Standard

Whatever route and specifics you choose to follow in the quest to develop a CAD standard for your organization, eventually there comes a time to release the standard into the wild. And to do that, you need to have a plan.

### The Deployment “Meta-Standard”

But first, you should be prepared to document the process that you follow to release your standard. Think of this as either a best practice, or a “meta-standard” for releasing standards.

Your release process, or best practice, does not have to be elaborate. In fact, a single page, or electronic document could satisfy your entire need here. Naturally, the more detail that is included, the better. Still, since this best practice is intended only for your own use, being sparse is acceptable.

Things to document in your deployment notes include:

- Server directory location(s) to be deployed to or updated
- Necessary support paths to be added to workstation installations
- List of deployed standards and / or detail libraries
- Last update date
- Contact information for CAD leaders to be notified on updates
- Any special log-in credential required
- Date of next schedule update

See, that isn't so bad. Now, store that sheet of information in a safe place where it can be easily found.

## Releasing the Standard

Now that you have all your notes collected to one sheet, it is time to deploy the CAD standard files. This can happen in one of two ways based on the material that you are releasing.

If the material being released is a document, such as an actual best practice PDF, then it would be best to post that information to an intranet page. SharePoint or a password-protected site operated by your organization will serve well for this. If you do not have access to such a resource, then post your PDF files to a server location available to everyone who needs access to the documents. Follow that placement with an email message to your team of CAD leaders and all CAD production staff.

If the material being release is a library of detail drawings, then these must be saved to a server location that is accessible to everyone who will use them for production. This process should include you deleting the previous detail library directory and replacing it with a fresh instance copied from a safe, reliable seed source. This will ensure that any files that may have been altered, or “improved,” by well-meaning staff are reset to their approved release versions.



Following the copying of the detail files to the server locations, an announcement should be posted. This can either be made on an intranet site, like SharePoint, or via email. The announcement should include a full list of details identifying any new or altered detail drawings. In the case of alterations to files, it should be noted what changes were made.

#### After the Deployment

Once the CAD standard has been developed, documented, authorized, and deployed the hardest work is behind you. Unfortunately, this does not mean that the work is done. Fortunately, it does mean that there is a significant reduction in effort.

Best practices that have been deployed are largely done. Maintenance and updates should only be required if any of the following three events take place:

- A software upgrade changes the documented workflow
- An organizational IT reconfiguration requires edits
- Errors must be corrected

In the case of detail libraries, the deployment phase cues the beginning of a maintenance routine. This will involve a regular, annual review of details to update release versions and integrity as well as any needed corrections. Of course, detail drawings created subsequent to the initial deployment must be added to the library directory.

Following revisions or additions in either of the above listed cases an update must be sent out to alert others. This notice should document any changes, deletions, or additions and be sent to all CAD leaders and production staff.

### **The Great Big Picture**

At this point any reasonable person may assume that they are done. A complete CAD standard, or some portion of one, has been completed. However, the truth is that no CAD standard is every truly complete. Following the development of any portion of the standard leads to the beginning of another portion. This process goes on and on, from topic to topic. It is very possible that it will take years to cover the full breadth of all the processes and assets needed to facilitate production in any organization.

Even if, by some quirk, it was possible to fully develop an all-encompassing CAD standard, ongoing maintenance is an absolute must. Ignoring this last facet of development can only lead to a standard that is sure to become stale, and eventually out date. Allowing that to happen is tantamount to wasting the full sum of all the combined billable hours used to develop the CAD standard. Given the number of stakeholders and contributors involved in development, it is obvious that is the sort of loss no one wants to be accountable for.

### **The MVP**

There about as many different sports-related analogies for business as there are people who have conducted business throughout the history of business. So, it is understandable if you assume that the MVP is the most valuable player on your CAD standards development team. But that isn't the case, even though that person is awesome also!

The MVP is your only key to sanity and actually getting anything out the door. It is the Minimal Viable Product, and it is your friend. Embrace it.



The concept of the “Minimal Viable Product” was introduced by Frank Robinson, but everyone today discusses in relation to a book called “The Lean Startup” written by Steven Bank and Eric Ries. And while it is a concept largely associate with “product development” it is absolutely key to the process of shipping a CAD standard.

Without the MVP 99% of all CAD standard creation efforts fail. The reason for this is simple, the standard is never finished. Ever. So what happens is that your very well-intended coordinator is working hard to include every bit of nuance to make the standard “100%” and as great as possible. But the boss wants to know why there is nothing to use yet? Meanwhile the meter is just running and the mountain of overhead costs is rising. Eventually the boss pulls the plug, announces the failure, fires one or two people, and everyone goes back to “business as usual” but can say “Well we tried to have a standard.” Oh and some people will say “I told you so!”

### **The MVP is the Key to Shipping**

In the seminal book “The War of Art,” (not to be confused with “The Art of War”) Steven Pressfield says that creators must ship. By that he means that you must, as some point, not only do the work but also finish the work. Half of the Mona Lisa is just paint on canvas. The completed Mona Lisa is a masterpiece.

In much the same way, an unfinished CAD standard, regardless of how thorough and brilliant it is, is useless until it is out in the world. It is just words and charts and images. Just bits of 1s and 0s on a hard drive somewhere in the world. But a “almost perfect” or “functional” CAD standard that is sent out to the CAD production staff? That changes the world for those people.

“Perfect” is pointless unless it goes into production. But “good” can be amazing if we just put it out there.

Your goal is to create a “good” standard, not a “perfect” standard.

### **When Good is Better than Great**

A “good” CAD standard has all the bare elements to guide a person through a process or concept. It has the layer names, the colors, the descriptions. It has the location of title blocks for insertion or fire hydrant details. It works because it has the MINIMUM information to make the product (the standard) viable. It is your Minimal Viable Product and that means it is “good” enough to ship to your production staff and your boss will think that is great!

### **Iteration Station**

One day you will even reach the MVP of your collection of standards (all of which should be MVPs in their own rite). This means you have covered the bases of standards for layers, file naming, file structure, and even created a minimal set of blocks. Congratulations, you have just pulled into the Iteration Station!

You’ve worked hard, won people over, dug for information, and shipped information that is changing the way people work and saving your firm money! Now go do it again. Not with new information, but with the MVP standards you have already shipped.

Revisit each one and bring in the same contributors for feedback. Makes notes and determine what the new pain points are. Repeat the same essential process used to create the MVP standard, but this time with the goal of revising the standard! And when you have a revised MVP standard ship the V2 out the door!

Your users and stakeholders will think you are a magic maker because not only have you done the impossible, now you are improving on it.



Obviously, you will also find areas to expand your MVP collection of standards to create new MVP standards. And at some point, you will have shipped the V2 of the complete collection. You know what that means, it's time for Round 3 and an even better MVP! Think of it as job security ...

## **Conclusion**

Creating your CAD standard isn't mysterious or dangerous. It isn't even hard. It is a process. And like any process it just has to be dissected to be understood properly. Now that you have a viable framework for the creation process I hope that you also have an appreciate for the steps that are the "meta" of the standard that contribute so much to the process. While the actual compilation and refinement of standards takes the lion's share of time, the meta steps create a truly solid foundation for success that you can build your standards on. And recognizing the importance and practicality of your Minimal Viable Product is key to maintaining stakeholder buy-in and your sanity.