

CS317873

# AutoCAD: Setting Up a Project Drawing Workflow with PlanGrid

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CADFMconsultants

## Learning Objectives

- Work through the necessary housekeeping required to get AutoCAD drawings into a project format
- Learn how to build the project folder structure to your internal CAD standard
- Learn how to add the drawings to the PlanGrid project and release them to site
- Learn how to work with PlanGrid, realizing the benefits of having a fully functional drawing management application to use while on-site

## Description

PlanGrid became an Autodesk company in 2018 and provides a browser- and app-based tool to work with smart drawings during the construction phase of a project. Setting up a project and linking drawings to the project is a simple process and lets you take advantage of mobile technology on the construction site. AutoCAD guru and LinkedIn learning [in]structor Shaun Bryant (CadJedi) will show you how to prepare an AutoCAD 2D drawing project, with associated drawings for use in PlanGrid. He'll take you through the necessary housekeeping required in AutoCAD, demonstrate how to add the drawings to the PlanGrid project, and show you the associated benefits PlanGrid provides when on-site.

## Speaker(s)

Shaun Bryant is an Autodesk Certified Instructor in both AutoCAD and Revit with over 31 years of industry experience. Shaun has worked as a consultant, trainer, manager, and user, with the earlier years of his CAD career in sales, pre-sales, and business development as a CAD manager/user. Shaun has been a director on the board of Autodesk User Group International (AUGI) and he is also the author of the reputable CAD blog, Not Just Cad! He is a seasoned Autodesk University AU speaker and was the AutoCAD expert at the inaugural Autodesk University London in June 2017. He is also an Autodesk

University Speaker Mentor, an AutoCAD Influencer and an Autodesk Expert Elite. He recently authored the Wiley title, 'Tinkercad For Dummies'. Known to dabble in a bit of rock 'n' roll as an established singer/songwriter, Shaun lives in Norwich in the UK and is the owner and director of CADFMconsultants Limited.

## Introduction

Some of you may know me as the AutoCAD guy who does all the AutoCAD video learning over at LinkedIn Learning (previously Lynda.com). I often get the “Are you the LinkedIn guy?” or “Are you the Lynda.com guy?” and its normally because they recognize my voice before they recognize me physically, which (sometimes) can feel a bit strange!

I’m also the owner of the blog, **Not Just CAD!**, which you will find here: -

<http://cadfmconsult.wordpress.com>

Construction is **BIG** business, and I have to say, I was suitably impressed when Autodesk announced its plans to acquire PlanGrid. I have worked in many different parts of the design process, ranging from architectural design to structural engineering, and having to develop facilities management asset drawings, but there was never a construction link in the Autodesk loop. Now there is.

Not only is PlanGrid the link in the loop, it is also an incredible product. It takes construction drawings mobile. With the advent of more and more handheld computing devices, such as an iPad Air or an iPad Pro, construction drawings can go anywhere with PlanGrid, making your construction team agile and quick to respond to anything onsite.

The PlanGrid website has some superb case studies, one of which is in Las Vegas itself, the Vegas Arena, constructed by The Raymond Group. You can check it out here: <https://www.plangrid.com/projects/vegas-arena>.

In the meantime, let’s get going, shall we? And get you up and learning about **setting up a project drawing workflow with PlanGrid**.

## 1. Work through the necessary housekeeping required to get AutoCAD drawings into a project format

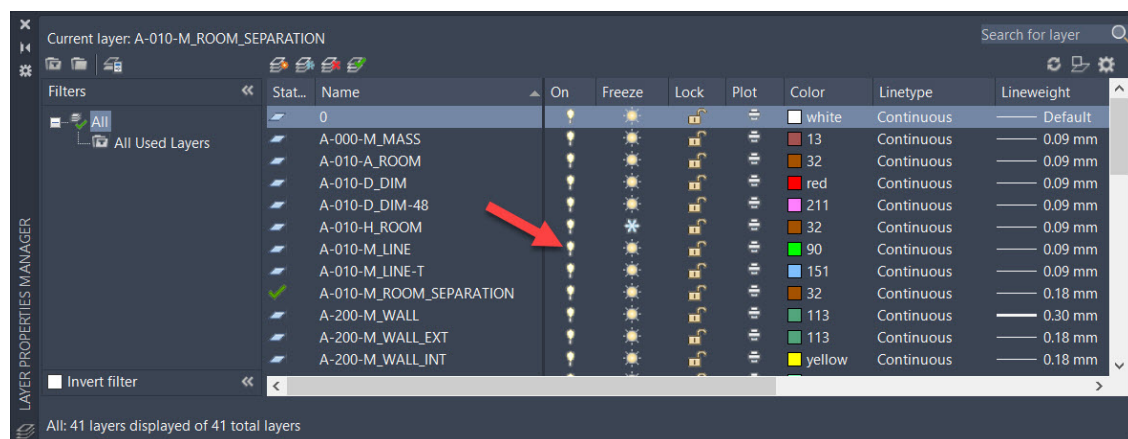
### Layers

Layers are fundamental to your AutoCAD drawings. Sometimes, though, we are sent drawings that are so loaded with layers that we cannot see the wood for the trees. There are so many layers in the DWG file, that the data you **NEED** to see is obscured by the data you **DO NOT** need to see.

The layers you don't need can be either hidden or removed, using the following: -

### ON/OFF

Layers can be hidden on a drawing by using the **ON/OFF** function in the layer properties. This is indicated by the lightbulb symbol in the Layer Properties Manager palette or the Layer pulldown menu.

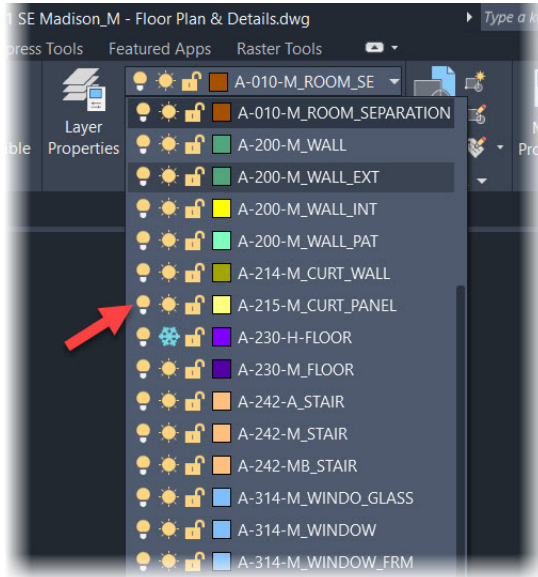


*The AutoCAD Layer Properties Manager with the lightbulb symbol arrowed*

A simple click on the lightbulb symbol is all that is needed to toggle a layer either on or off in the drawing. A **YELLOW** lightbulb indicates that the layer is **ON**, and a **BLUE** lightbulb indicates that the layer is **OFF** in the drawing.

This may seem like such simple stuff to an advanced AutoCAD user, but layer management is one of the biggest issues when issuing drawings for construction,

especially electronically. Use the tools in AutoCAD to make sure that you only display what is **NEEDED**.



*The AutoCAD Layer pulldown menu with the lightbulb symbol arrowed*

The lightbulb symbol is great for layers that are turned on and off on a regular basis. Be aware as well, that when a layer is on, it is visible and available for plotting. When a layer is off, it is invisible and is not plotted, even if Plot is on in the layer properties.

### **FREEZE/THAW (in all viewports)**

Layers can also be hidden on a drawing by using the **FREEZE/THAW** function in the layer properties. This is indicated by a **SNOWFLAKE** symbol for **FREEZE** and a **SUN** symbol for **THAW**.

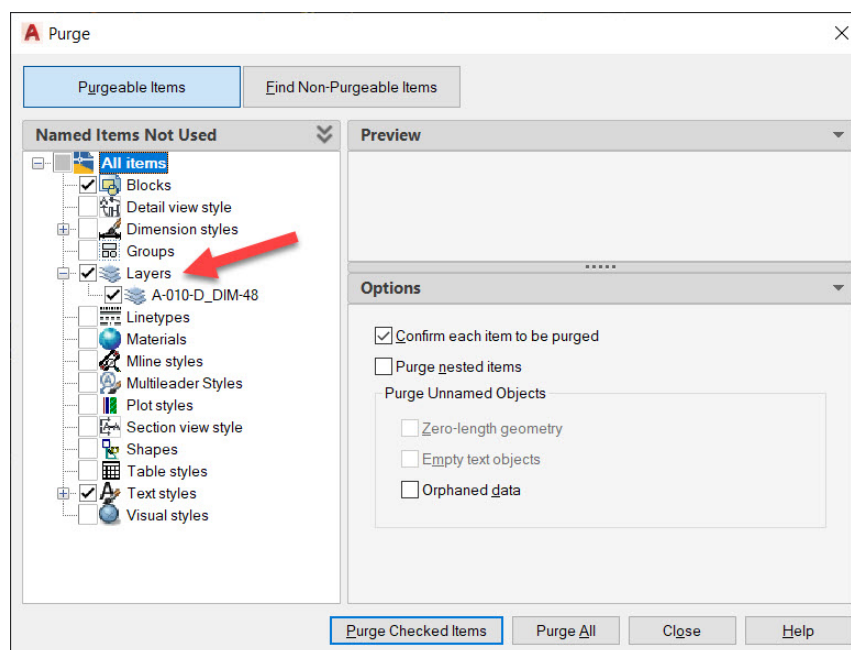
Again, advanced users might think that this is really basic stuff, but did you know that when you freeze a layer in a drawing, not only is it hidden, but it is then not considered for regeneration when the drawing is saved, closed and then opened again? Think about this for a moment. You have a complex drawing with 5000 layers. You freeze 3000 of those layers, which are **NOT** regenerated when the drawing is next reopened. The drawing will open **MUCH** quicker, saving you a lot of time.

Ideally, you should freeze the layers you want to be hidden for long periods. When you thaw a frozen layer, AutoCAD regenerates and displays the objects on that layer. As mentioned above, if you want to switch between hidden and visible layers frequently, use the ON/OFF setting. In your layouts, you can also freeze layers in all viewports, in the current viewport, or in any new viewports as they are created.

## PURGE

**PURGE** is a great command for bringing down file size. It can clear out not only layers, but many other AutoCAD objects and attributes as well. Let's just look at layers right now, though.

If you receive a layer-heavy drawing, one of the best ways to clear out all the layers that are not used is to purge them out of the DWG file. Using the **PURGE** command, you can work through the Purge dialog box, checking which layers you need and don't need.



*The AutoCAD Purge dialog box, with the only layer not in use, available to be purged*

If any layers are in use in the drawing, they cannot be purged, and they will be displayed in the Non-Purgeable Items list which displays when you click on the **Find Non-Purgeable Items** button.

As you can see in the Purge dialog box shown above, only the **A-010-D\_DIM-48** layer can be purged from the drawing.

**NOTE: -**

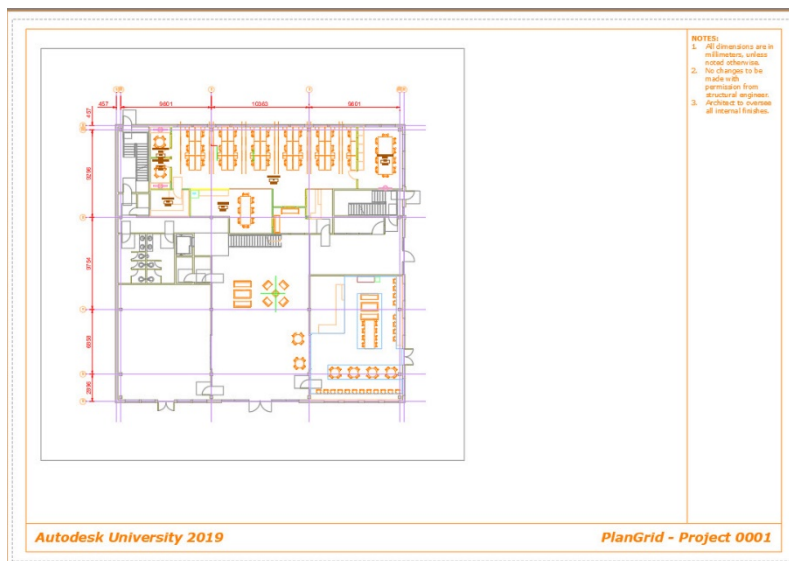
When using **PURGE**, use it with caution. It is **VERY** easy to purge out layers that you may need later, which then involves creating them again. Always perform a little sanity check, just before hitting the **Purge Checked Items** button!

## Layouts

Layouts are the method you use in AutoCAD to communicate your design intent. They normally consist of a titleblock and scaled viewports of your design in the Model tab.

Again, like layers, you want to ensure that you are only displaying what **NEEDS** to be displayed. If you feel a layout is too 'busy', create another one and add more design information to it. That way, in PlanGrid, you are ensuring a clear, concise drawing layout that is easy to read with the appropriate information displayed.

In the live class, we are using the **1031 SE Madison** dataset, which consists of one DWG file (a GA plan), which has one layout with a titleblock and one scaled viewport. This keeps it simple and allows for the workflow and process to be made obvious, rather than be bogged down with itty-bitty drawing details.



The 1031 SE Madison drawing, showing the layout tab and the scaled viewport

The drawing shown will be set up in a new PlanGrid project, ready for use by the construction team, with just the one layout, for clarity.

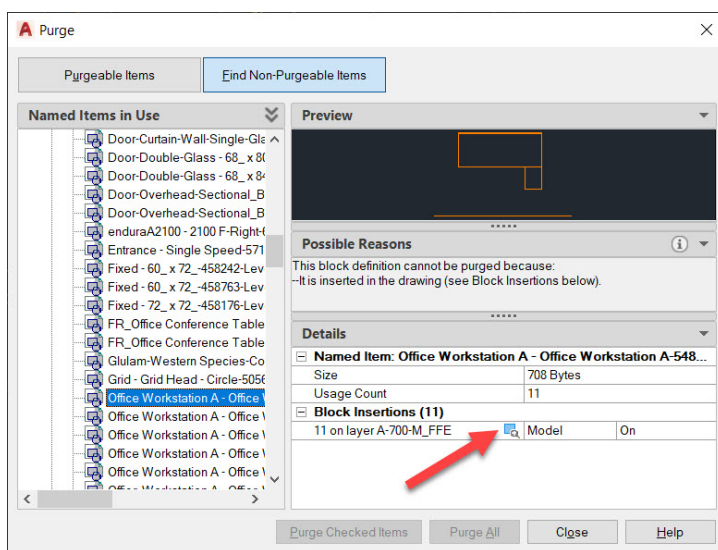
Try not to get bogged down with too many layouts in each DWG file. My own personal rule of thumb when issuing for construction is to aim for not more than five layouts per DWG. Bear in mind, you will want each layout to be a drawing in PlanGrid. Less is more!

## Blocks

AutoCAD blocks are used for many things, allowing for design reuse. There could be blocks in your drawing for windows, doors, even taps and bathroom washbasins. The problem with blocks is there can be a huge amount hiding in your DWG file that never get used.

We mentioned **PURGE** earlier for layers. It can also be used for blocks in the same way. The **PURGE** command will allow you to find the blocks that aren't being used in your drawing. These can be purged out in the same way as layers are purged.

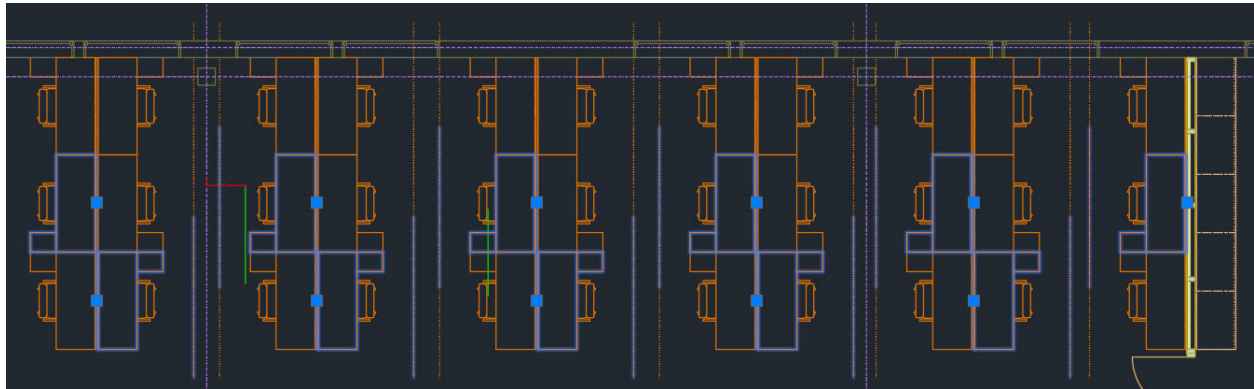
One of the nice features in the new Purge dialog box in AutoCAD 2020 is the ability to locate blocks that **ARE** being used, and subsequently, remove them from a DWG file if needed. All you need to do is select an already used block, and then click on the **Select Objects** icon in the Purge dialog box. The dialog box will close, and the blocks will be shown in a selection set in the drawing.



*The Purge dialog box, showing a used block and the Select Objects icon (arrowed)*



After clicking on Select Objects, you will be taken back to the drawing and you will see the blocks highlighted, thus allowing for easy removal if needed.



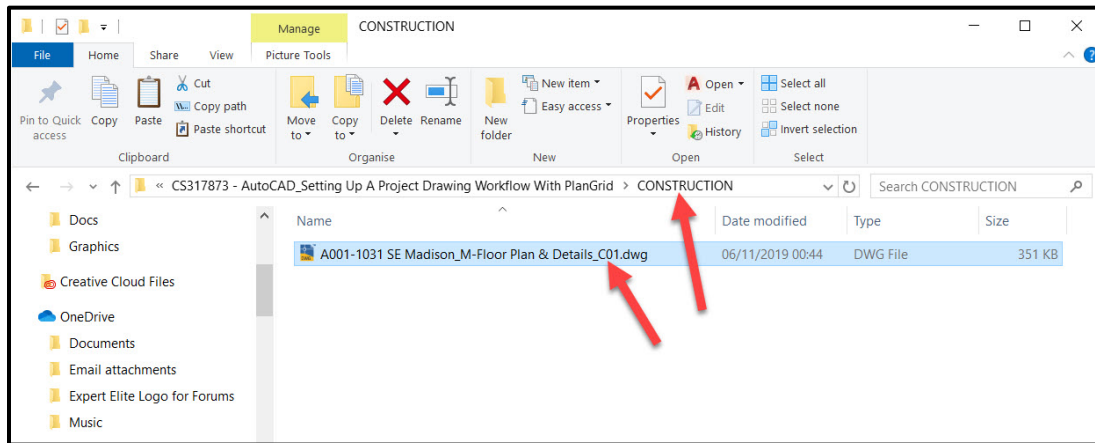
*The 11 workstation blocks all selected and highlighted by the Select Objects icon in the Purge dialog box*

## New drawings and folder structure

A trick I was once taught in my early AutoCAD days, was that you should always perform a **Save As...** before you start working on a drawing. That way, you won't change what was on the existing drawing. Saving the existing drawing as a new drawing with a different filename will stand you in good stead with construction issues to. If you start working on a drawing at revision C01 and then save to a new drawing as revision C02, you are retaining all the information on the C01 drawing by working on a separate drawing. It creates an audit trail, allowing you to go back and see what information was added/removed at revision C01.

Folder structure on a project is always important too. If you are saving new construction drawings at the construction phase always keep them separate to your design drawings. I have seen so many organizations and companies where all the DWG are just dumped in one folder in the hope that filenames and revisions will be noticed when drawings are worked in. A **CONSTRUCTION** or **FOR CONSTRUCTION** folder makes all the difference!

Over the page, you will see a simple folder naming philosophy that allows for construction drawings to be stored separately from the design drawings. It's not rocket science, and it saves a lot of pain later!



*A simple folder structure showing the CONSTRUCTION folder, and a drawing at the revision C01*

In conclusion, we have only touched the surface of how to perform housekeeping on a drawing before it is issued for construction. There are **MANY** elements to construction drawing management, and books could be (and have been!) written on the subject.

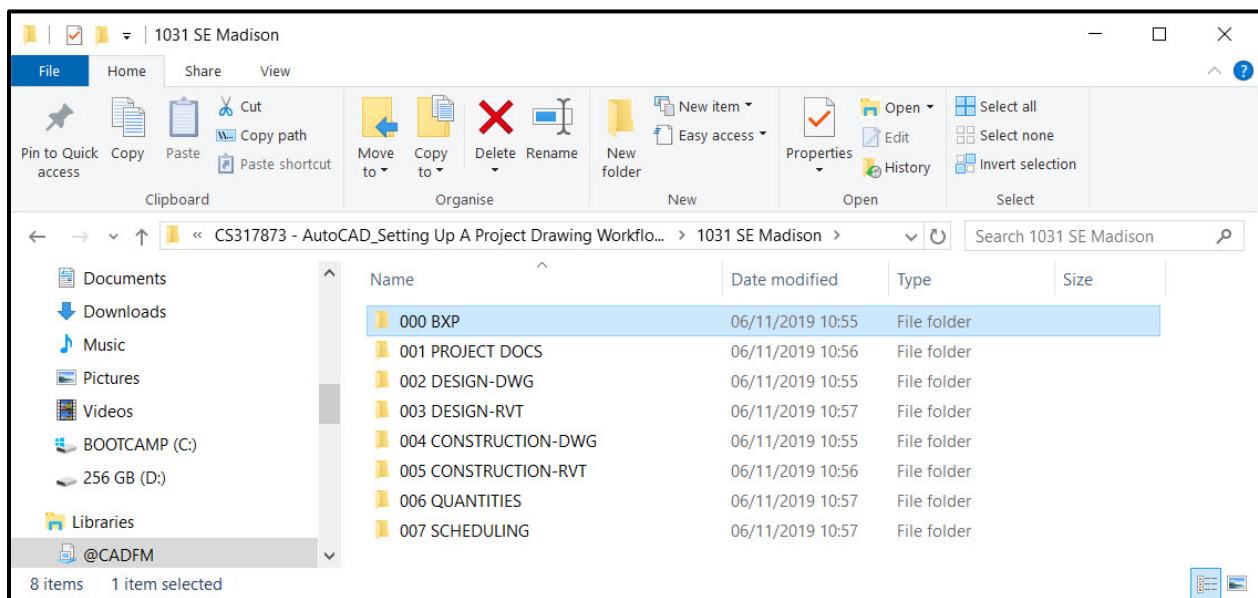
It's enough to say though that you **DO** need to make changes to your drawings before issuing them for construction, and if you do, the transition to PlanGrid is much easier.

## 2. Learn how to build the project folder structure to your internal CAD standard

In the previous section, we touched on having a **CONSTRUCTION** folder for all your construction drawings. Let's take that further and develop a simple folder structure that is standardized for the whole project, so that when we go into PlanGrid, we know where all the project documents are when we transfer them to PlanGrid for our construction team.

I am going to keep this incredibly simple, so that we can observe the workflow process involved, and not get bogged down with the detail. That can come later, should you need it.

Initially, you need a root **PROJECT** folder. This can be stored on a server, in the cloud, or wherever you need it to be. It just needs to have sharing permissions so that the whole team can access the contents. The project folder will be named (in this case) as **1031 SE Madison**, which is the address location of the project.



*A simple project folder structure for the 1031 SE Madison project*

You can see that the project is broken down into eight sub-folders. These are as follows: -

### 000 – BXP

The BIM eXecution Plan (BXP) is used as a basis for all BIM-based projects. This is where all BXP documents would be stored.

### 001 – PROJECT DOCS

This would be a location for all project documents such as CAD standards, contracts and other relevant documents.

### 002 – DESIGN-DWG

The location for all **DESIGN** drawings in a DWG file format used by AutoCAD.

### 003 – DESIGN-RVT

The location for all **DESIGN** models in an RVT file format used by Revit.

### 004 – CONSTRUCTION-DWG

The location for all **CONSTRUCTION** drawings in a DWG file format used by AutoCAD.

### 005 – CONSTRUCTION-RVT

The location for all **CONSTRUCTION** models in an RVT file format used by Revit.

### 006 – QUANTITIES

The location for all files relating to quantities used on a project, such as spreadsheets used by the Quantity Surveyor to calculate materials etc.

### 007 – SCHEDULES

The location for all schedules in all file formats, such as column schedules, material schedules, door schedules and window schedules.

The above provides a simplistic file structure that is easy to follow for the purposes of this class. It gives an insight in to the workflow needed to generate that structure. The most important element of this structure is that the **CONSTRUCTION** files (DWG & RVT) are kept **separate** from the **DESIGN** files (DWG & RVT).

### 3. Learn how to add the drawings to the PlanGrid project and release them to site

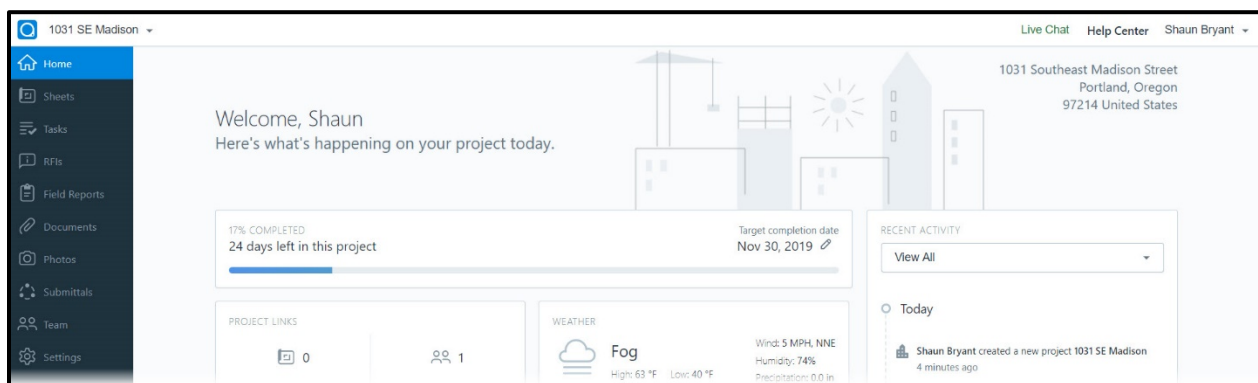
Now that you have drawings that are ready to go out for construction, the next step is to get them into PlanGrid. Before you do that, you need to perform a bit of setting up. You will need the following: -

1. A PlanGrid account
2. The email addresses of the team, so that you can add them into the PlanGrid project.
3. Project details – location (address), start date, finish date and so on.

Once you have these details, you can get started in your browser, and go to the PlanGrid website ([www.plangrid.com](http://www.plangrid.com)) and get logged in using your account.

The next step is to set up a new project in PlanGrid, which is easy to do, using the green New Project button (top right) in the screen where you view all your PlanGrid projects. This has been done already and the new project name is the same as your root project folder; **1031 SE Madison**.

Once a new project has been set up, if you click on the project on the Projects page in PlanGrid, you will see the homepage for your project.



*Your project homepage as shown in PlanGrid in a browser*

You will see in the homepage that you can not only upload drawings (known as **SHEETS** in PlanGrid), but you can also set up a folder structure for relevant project documents. This document structure can then follow your project structure you set up earlier.

PlanGrid is set up to receive **SHEETS** as **PDF files**, so you need to issue your drawings as PDFs out of AutoCAD. AutoCAD now has some excellent pre-set PC3 files for PDF output, that give great drawing clarity. I would recommend that you use these, as the dpi settings work well and there is then no need for any extra setup.

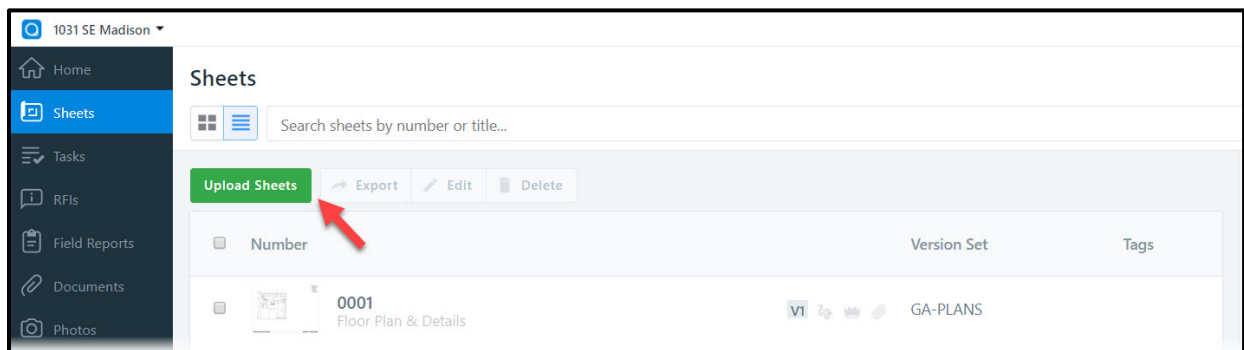
**Here's a *Takeaway Tip* for you.**

*The AutoCAD PC3 files for output to PDF are as follows; **AutoCAD PDF (General Documentation).pc3**, **AutoCAD PDF (High Quality Print).pc3**, **AutoCAD PDF (smallest File).pc3** and **AutoCAD PDF (Web and Mobile).pc3**. The best suggested pc3 file to use for PlanGrid issues is the High Quality Print pc3. This will then give the best clarity on sheets when viewing them on mobile devices.*

## Uploading your sheets into PlanGrid

As mentioned above, your issued AutoCAD drawings (now PDF files) now need to be uploaded as sheets into PlanGrid. Once logged in, this is a very simple process, like uploading files to the cloud in apps such as Dropbox, Google Drive and OneDrive.

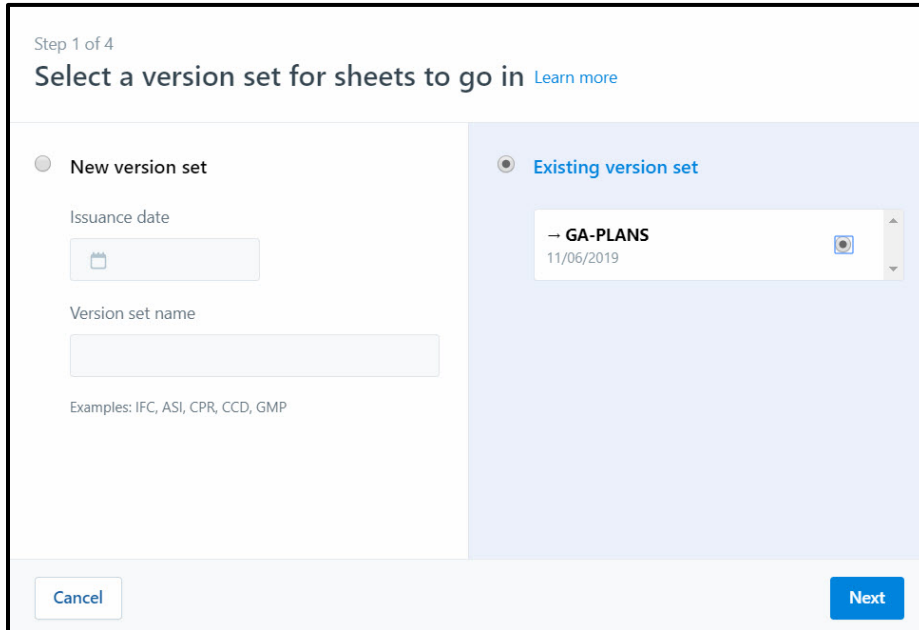
Using the **Sheets** option on the left-hand menu in PlanGrid, simply click on the green **Upload Sheets** icon.



You can then drag and drop files, or upload via your computer, if you wish (see overleaf).

Uploading a sheet into PlanGrid is a four-step process.

**Step 1 of 4** is deciding on if you need a **new** or **existing version set** for your sheet.



Step 1 of 4

Select a version set for sheets to go in [Learn more](#)

☐ New version set

Issuance date

Version set name

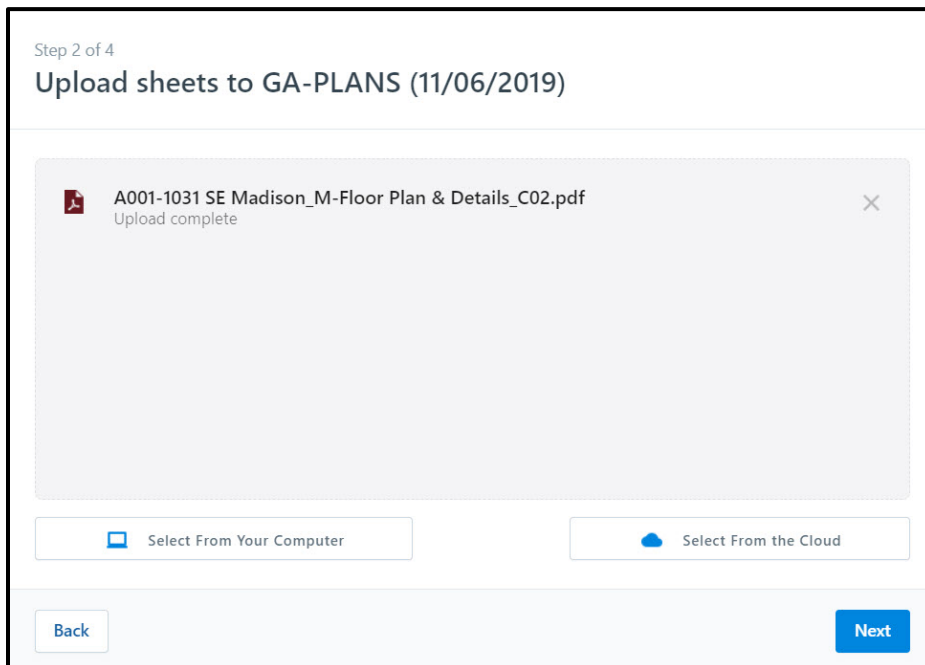
Examples: IFC, ASI, CPR, CCD, GMP

☒ Existing version set

→ GA-PLANS  
11/06/2019

Cancel Next

**Step 2 of 4**, you select your sheet to upload from your computer or the cloud.



Step 2 of 4

Upload sheets to GA-PLANS (11/06/2019)

A001-1031 SE Madison\_M-Floor Plan & Details\_C02.pdf  
Upload complete

Select From Your Computer Select From the Cloud

Back Next

**Step 3 of 4**, you review your sheet numbers and edit where necessary (0001C02)


Publish Log > Uploading sheets to GA-PLANS (11/06/2019) > Step 3 of 4: Review your sheet numbers

STEP 3 OF 4

## Review sheet numbers

Our robot tried to read your sheet numbers automatically to save you time. Please scroll down and fix any that aren't correct.

☒ 1 Sheet Selected 90° 90° 180° Choose Area for Sheet Number Extraction Edit Sheet Numbers Delete Sheets

<input checked="" type="checkbox"/>	A001-1031 SE Madison,...		0001C02
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**Sheet Numbers Are Correct**

Final step is to add sheet titles and tags


**Step 4 of 4**, add your sheet title and tags (where applicable)

Publish Log > Uploading sheets to GA-PLANS (11/06/2019) > Step 4 of 4: Add sheet titles and tags

STEP 4 OF 4

## Add sheet titles and tags

Adding titles and tags helps your team quickly find sheets while in the field. Select multiple sheets to add or edit many at once.

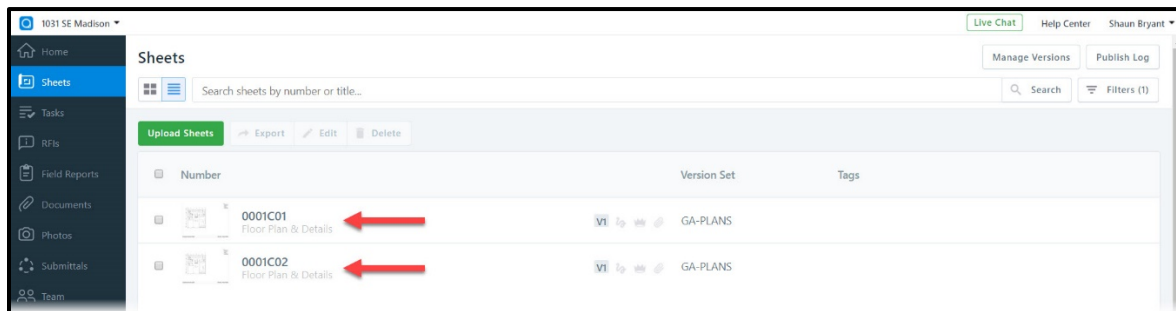
<input type="checkbox"/>	Sheet Number	Sheet Thumbnail	Sheet Title	Tags
<input type="checkbox"/>	0001C02		<input type="text" value="Floor Plan &amp; Details"/>	<input type="text" value="+ Add new tag"/>

Once you have been through these steps and added your sheet(s) to PlanGrid, you will see your sheets displayed in a list in your project. Not only are these sheets now available



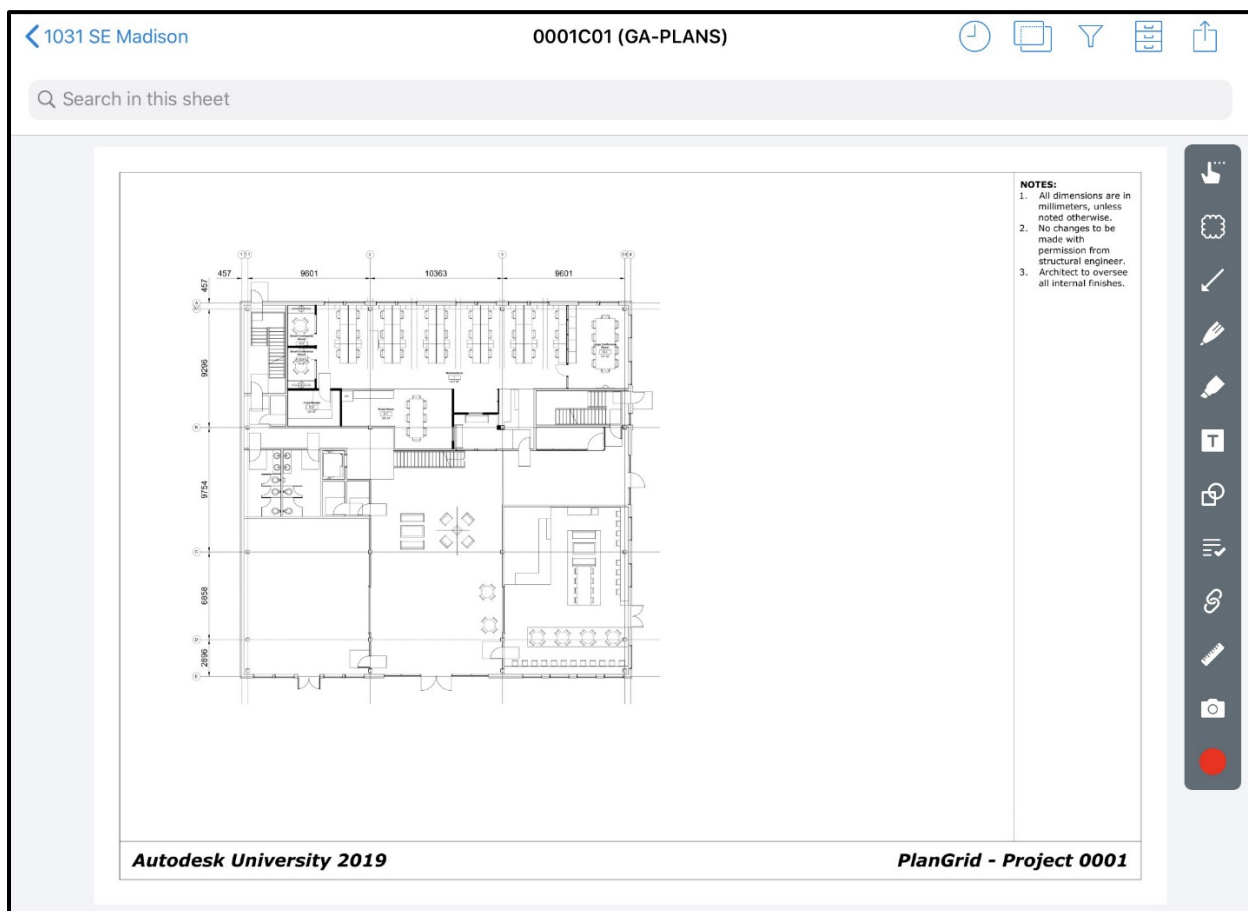
in PlanGrid in a browser, but they are now available to your construction team on their iPads out on the construction site. How wicked cool is that?

You have now got your sheets out there in PlanGrid, so let's use PlanGrid to our advantage!



#### 4. Learn how to work with PlanGrid, realizing the benefits of having a fully functional drawing management application to use on-site

PlanGrid is a fantastic construction solution. Your CAD team in the office can log in via a browser, and issue sheets and documents with ease. The construction team can then work with those sheets and documents while they are mobile, using a smartphone or a tablet. In my case, PlanGrid is used on an iPad Air.



*An open drawing sheet in PlanGrid, on a 2018 iPad Air, ready for markup*

PlanGrid gives you incredible onsite capabilities that you simply would not have were you just issuing drawings out to PDF. Acrobat Reader pales into insignificance when you see what PlanGrid can do. I could easily run a **THREE-day** class on just PlanGrid alone, so I am just going to show you some of the uber-cool features PlanGrid has to offer.

## Real-time markups

How many times have you been there?

You know, when you have a large drawing/blueprint held down by two of you in the wind, and it's snowing. You are standing at the total station trying to see the construction details to mark it up with a red pen? Or am I just showing my age? 😊



*Photo credit: 123RF.com*

With PlanGrid, yes, you will still be in the snow, but you won't have to worry about that pesky sheet of paper blowing around! With PlanGrid on your tablet, you can: -

- Zoom in to see detail
- Pan around the sheet with ease

But, best of all?

## You can **redline** and **markup** in REAL TIME!

Using just your fingertips (or in my case, my Apple Pencil), you can use the tablet interface to your advantage to redline and markup **ANY** sheet.

Here's a marked-up sheet on my iPad Air: -



*A marked-up sheet in PlanGrid, on a 2018 iPad Air*

So, I've marked up the sheet in the PlanGrid app on-site. I have published it to the project also. Providing I have an internet connection, this automatically syncs to everyone else on the project.

The sheet will **INSTANTLY SYNC**, and the CAD team will see the mark-ups in **REAL-TIME**, which means they can get on with them straightaway. No waiting for me to get back to

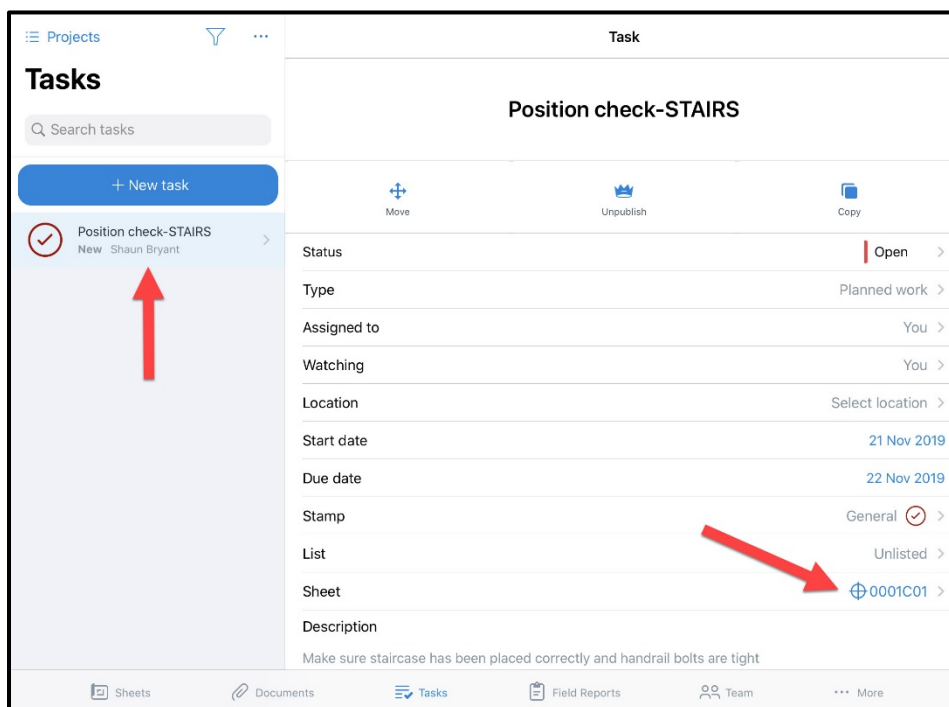
the office, with a soggy drawing sheet where the redlining has smudged in the snow, right?

## Tasks Sheet Association

A recent update to PlanGrid, that allows you to assign specific tasks to sheets in real-time.

A task can be added, removed, or moved between sheets in your PlanGrid project. This provides not only flexibility on how project tasks are created, managed or tracked, but also allows for accurate mapping of tasks to exact locations on the sheets too. The tasks can also be moved at any time.

A task is defined in the **Tasks** option, either in the browser (normally in the office) or on a tablet (on-site). A typical task is shown below: -

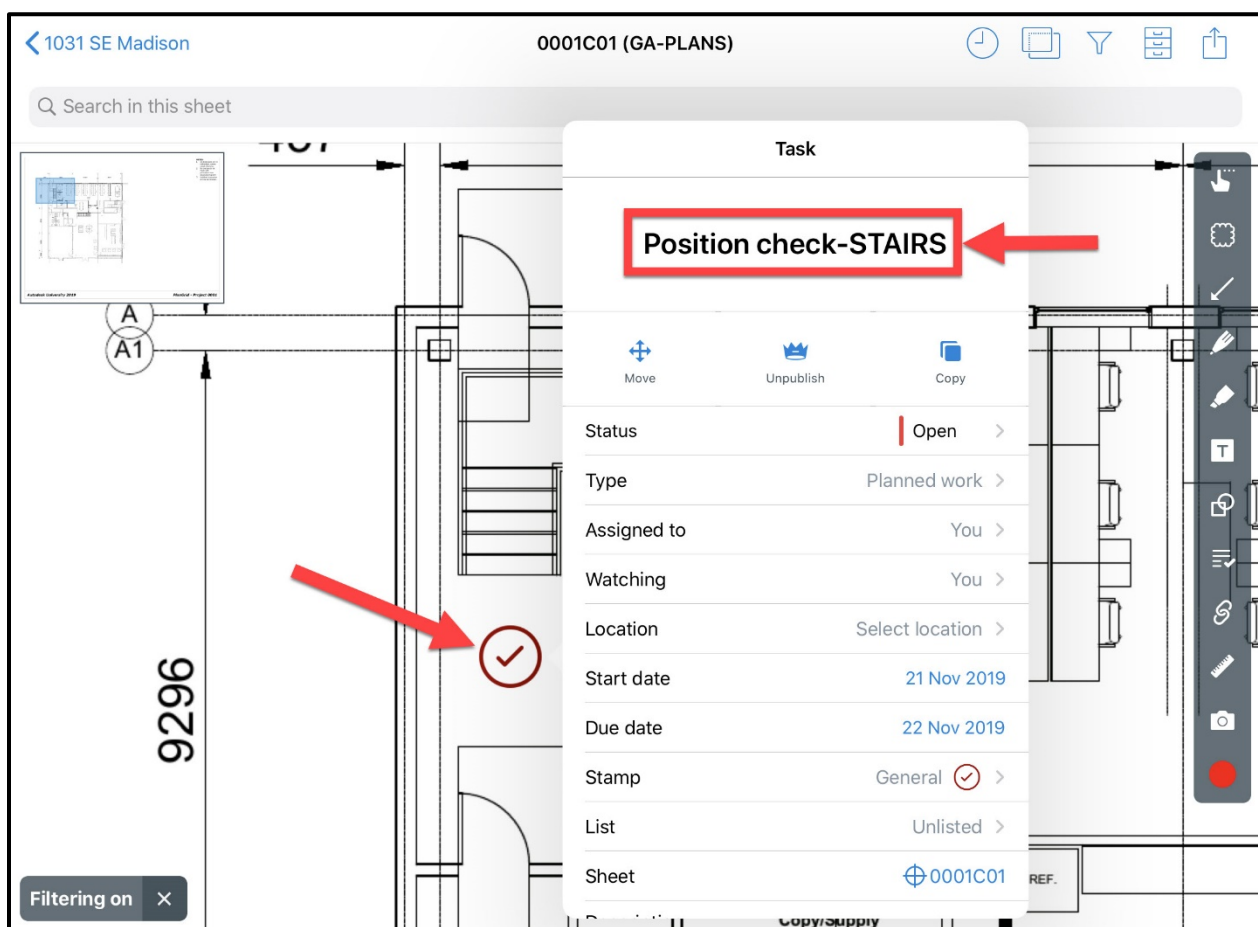


*A typical task assignment in PlanGrid, on an iPad Air*

As you can see, you can add a sheet association in the task assignment as it is created (arrowed). Once that association is in place, you can simply click on the sheet number in

the task to go to the assigned sheet, making your on-site existence that much more bearable (especially if it is still snowing).

Once the task is assigned to the sheet it can be moved on the sheet too, making the task location even more accurate. When you click on the sheet in the task assignment, it automatically opens the sheet and zooms to the task location. Note the location of the task stamp (checkmark in circle) in the sheet below (with the task open). That can be moved to any location on the sheet using the **Move** command shown in the open task.



*A task assignment open, in a sheet in PlanGrid, with the task location arrowed (checkmark in circle)*

Accurate task location is a great function in PlanGrid as tasks can then be positioned **EXACTLY** where they need to be done on the sheet, rather than them just being 'on the sheet somewhere'!

## Task Reports (web only)

Task reporting in PlanGrid web has also been improved.

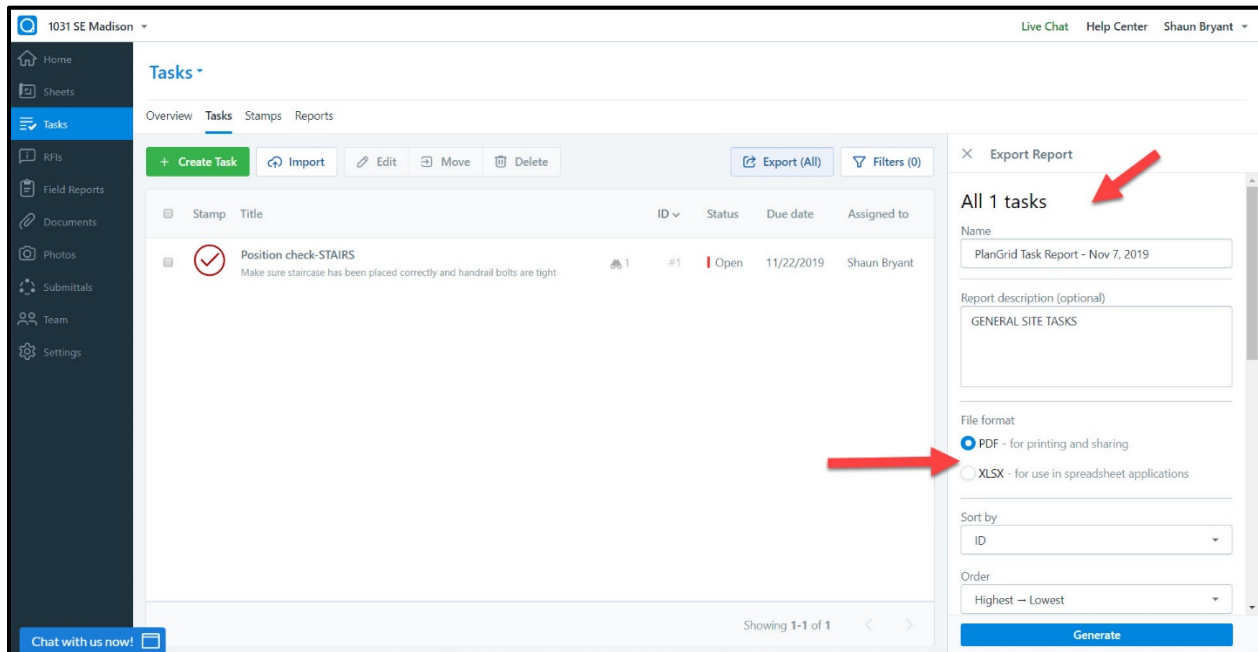
Stakeholders in a project need to be informed to assess any impacts on costs or scheduling in a project. In PlanGrid web (browser), users can now customize task reports before sharing them with stakeholders such as managers and general contractors, who may not have a PlanGrid license.

The new reporting configurations allow for **SPECIFIC** reporting to the **RELEVANT** stakeholder, making sure that there is accurate collaboration between all project team members.

The new options include: -

- Adding photos
- Adding comments
- How many tasks per page
- Additional fields such as: -
  - Assignees/watchers
  - Cost/schedule impact
  - Due dates

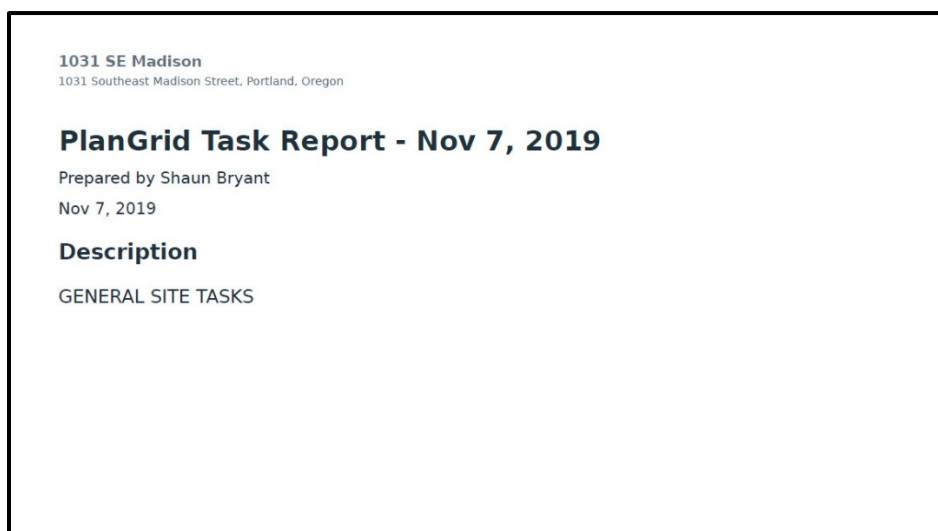
To give you an idea of how this looks in PlanGrid web, overleaf is a simple report about to be prepared.



A task report being prepared in PlanGrid web (see the Export Report pane – arrowed)

The task report can be shipped to any stakeholder or team member, either in **PDF** or **XLSX** format, for ease of use. This means that the report recipient does **NOT** need to have a PlanGrid license.

An exported report in PDF format is shown below (front page and page 1 of the report) which shows how a task is displayed in the PDF format: -



The task report front page in PDF format



1031 SE Madison  
1031 Southeast Madison Street, Portland, Oregon

### #1 Position check-STAIRS

<b>Status</b> Open	<b>Assignees</b> shaun.bryant@cadfmconsult.co.uk	<b>Sheet</b> 0001C01
<b>Type</b> Planned Work	<b>Watchers</b> shaun.bryant@cadfmconsult.co.uk	
<b>Description</b> Make sure staircase has been placed correctly and handrail bolts are tight	<b>Start Date</b> Nov 21, 2019	
<b>Due At</b> Nov 22, 2019	<b>Created</b> Nov 7, 2019 12:32 PM shaun.bryant@cadfmconsult.co.uk	
<b>Last Updated</b> Nov 7, 2019 12:37 PM		

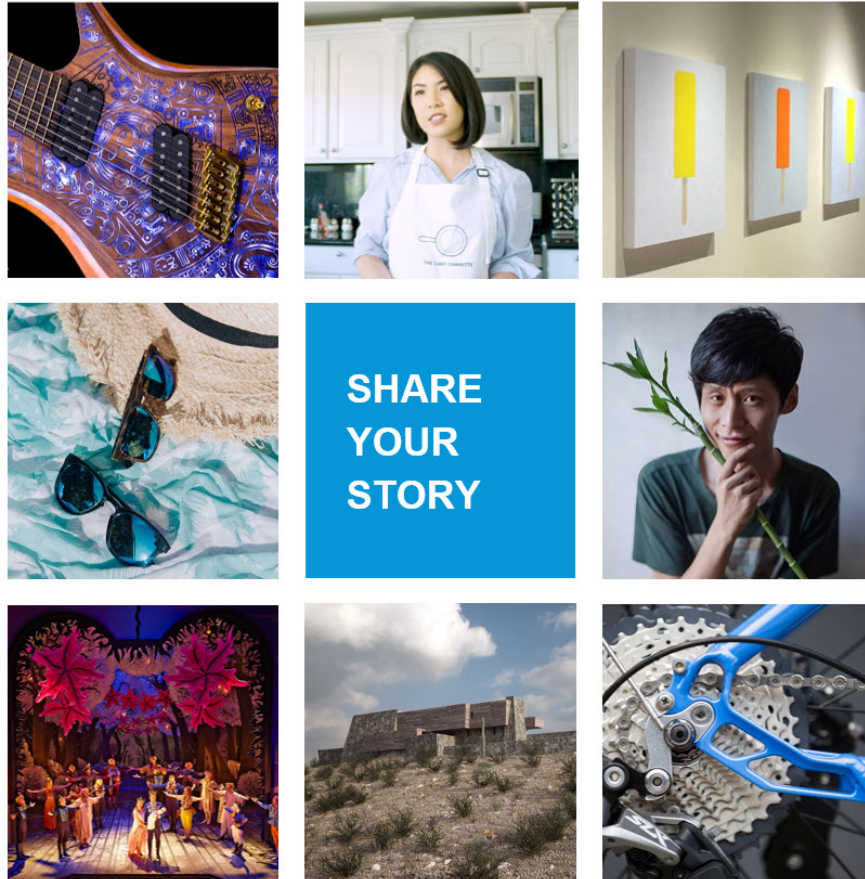
Page 1 of the task report, showing a task assignment and the sheet location of the task

I have only touched the surface of what PlanGrid can do for you in construction terms. It is an incredible tool and will revolutionize how you take your AutoCAD drawings on-site for construction purposes.

It provides speed, efficiency and mobility and utilizes the latest technology to make the construction process quicker and easier.

Plus, it sure beats trying to hold a large paper drawing in the snow and the wind, right?

## AutoCAD needs YOU!



### Want to be featured by AutoCAD?

We want to hear your story!

Go to: [autode.sk/autocadstory](https://autodesk.com/autocadstory)

The AutoCAD team is looking for more stories from customers like you to share on the website, blog, and in marketing materials. I'm sure all of you here can think of a cool project you've worked on using AutoCAD that could be featured. Get out your phone and put in this link: [autode.sk/autocadstory](https://autodesk.com/autocadstory) to submit your project. AutoCAD is looking for a variety of stories from all different parts of the world, so I encourage you to fill out the link and get your work featured.

Thank you for attending my class!

My contact details are as follows: -

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