PlanGrid

Connected, Anywhere.

8 Field Focused Challenges in Heavy Civil Construction And How to Overcome Them

What's Inside

Introduction

Heavy Civil and Infrastructure projects are some of the largest and most critical support structures in society. These projects include roads, bridges, tunnels, sewers and other public works resources that people rely on. To put this in perspective—in order to meet the world's basic infrastructure needs—$3.3 trillion per year will need to be spent through 2030.

Weak technology in the field has historically limited improving how Heavy Civil and Infrastructure projects are approached. When field teams are unable to communicate and receive real-time feedback from engineers and designers, entire projects suffer. The ability to curtail costs and complete work within budget is key to managing the world's growing infrastructure needs.

Why do these disruptions and productivity delays occur? Information gaps impact decision making and hinder deployment of resources to where they are needed most. Issues with tracking and accountability mean problems often go unresolved or unnoticed until they cause delays. Reports and communications are often complicated by the realities of horizontal job sites—varying weather conditions, teams physically spread over long distances and inconsistent or nonexistent connection to the internet in remote areas.

Construction isn't about to get less complicated anytime soon, but the complexities can be streamlined by bringing technology on board. To start improving large-scale civil construction and megaprojects, the whole team needs to be on the same page. The right software tools will allow you to manage projects and communicate in real-time, improving productivity on a measurable scale.

The Biggest Challenges in Heavy Civil Construction

Most Heavy Civil projects employ a widely dispersed and disconnected labor force. Project scopes typically includes many features located outside and underground. With the right software tools, firms can address their biggest challenges and complete projects efficiently and under budget. Typical project challenges include:

- Hard bids that leave little margin for error
- Large labor forces spread out over long geographic distances
- Hidden work that is hard to document
- Lack of connectivity on the jobsite
- Unforeseen site conditions
- Equipment/fleet tracking and rental costs
- Worker and jobsite safety
- Cost reconciliation delays that impact payments

We will explore these challenges in detail and offer insight where software solutions can help.

Hard bids that leave little margin for error

Most Heavy Civil and Infrastructure projects are a conducted in a "hard bid" scenario. Unfortunately, many contractors have a bidding process that leaves too many opportunities for error. If a hard bid is priced too high, you lose the job. Priced too low, the project risks losing money. Fortunately, modern software tools have features that can help streamline your bidding process, leading to successful bids and more profitable projects. When selecting bidding software, look for tools that allow you to:

Send invitations to bid within the software platform

Most bidding tools should send invitations to bid from one centralized location. They enable you to receive bid proposals, send requests for more information and know the progress of subcontractor bids at all times.

Share project documents

Your tool should provide a central location for project documents. You should be able to monitor what files the subcontractors view and collaborate on estimating and takeoffs within the software.

Manage subcontractor data

It's important to maintain a private subcontractor database. You should be able to organize subs by trade, location, minority status and more.

Prequalify Subcontractors

The right tool will save time by helping prequalify your subcontractors. Many software platforms will help generate a prequalification questionnaire to find the right subs for every project.

For more tips to ensure you've mastered the bidding process, jump over to the PlanGrid blog and read "**Bid Less, Win More: How to Master the Construction Bidding Process.**"

Large labor forces are spread out over long geographic distances

Better communication is essential in any industry, but it is crucial for construction teams to be successful. Communication between the project design team, the construction site management and the owners all impact completing the job quickly and efficiently. Lack of communication between all parties is a roadblock to timely completion.

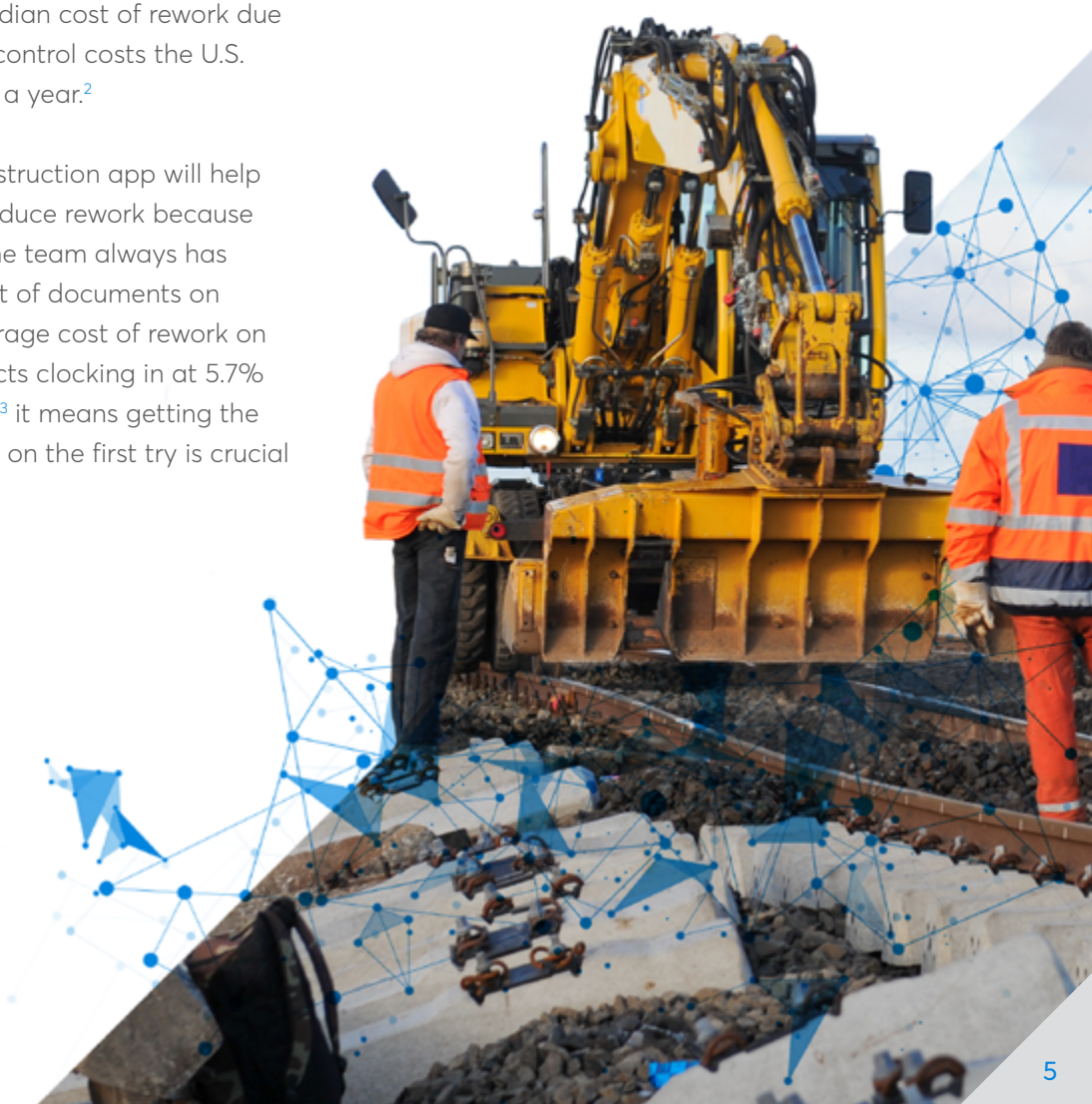
Improve Communication and Collaboration

Many projects experience cost overruns that can largely be attributed to unnecessary downtime or delays. This is often a byproduct of inefficiencies that can be virtually eliminated with real-time communication and collaboration via mobile construction apps. What's more, built-in notifications can prompt workers to take action or alert them of important changes, eliminating idle workers or downtime on the jobsite.

Eliminate Rework

One of the most common causes of rework is poor communication and error from lack of document control. Roughly 65% of construction professionals say the biggest problem they face is the cost of doing rework[1] and the median cost of rework due to poor document control costs the U.S. industry $4.2 billion a year.[2]

A good mobile construction app will help you dramatically reduce rework because every member of the team always has the most current set of documents on hand. With the average cost of rework on infrastructure projects clocking in at 5.7% of the total budget,[3] it means getting the work done properly on the first try is crucial for success.



Hidden work that is hard to document

Infrastructure and Heavy Civil projects often contain extensive hidden scopes of work. Many parts of these projects are underground or encased in concrete. If you're burying an expanse of rebar under concrete, modern software tools will capture the progress for inspections and allow you to reference that information years after the project has been completed. Additionally, clearly documenting utility work has always been a challenge on project sites that span hundreds of miles. This is where GPS enabled tools become important.

GPS and Geotagging at the Project Site

One benefit of GPS construction technology is enhancing the documentation of project progress through geotagged photos. All that's needed is a GPS enabled digital camera. Some construction software can even sync the GPS information in your photos to a specific location on your jobsite and organize them automatically, helping you easily document the location of utility work.

Geotagging allows you to capture longitude, latitude, date and time of the photo. This information is critical when teams are surveying and documenting existing conditions and utilities. Recording GPS coordinates shows exactly where a photo was taken.

Digital Drawings at Project Turnover

Having a digital record of project information is valuable at turnover. Poor documentation can even lead to dangerous conditions during facility operation, especially if data handover is done poorly. The right software tool should provide an in-depth record of all historical construction data. In a typical setting, 30% of project data and documentation is lost at project turnover.[4] Using the right tool to manage and store your information makes this data loss at turnover a thing of the past.

Lack of connectivity on the jobsite

Mobile enabled tools keep the field and office employees connected with the latest project information. The right tool will allow your teams to view all the plans and project documentation either online or off, completely independent of internet access or mobile service. Once a team member returns to an area with connectivity, the tool should automatically sync and push any offline markups that were made to the rest of the team.

Numerous studies conducted over a 30-year period documented levels of time waste in construction activity, with one analysis concluding that an average of 49.6 percent of time in construction is devoted to wasteful activity.[5] With mobile construction apps, your team won't be trudging back and forth from the jobsite to the trailer or suffering delays waiting for drawing revisions to get printed, delivered and distributed across the project site.

Mobile tools reduce time waste, allowing builders to focus on what they do best—build. In some cases, these tools can accelerate project schedules, allowing construction firms to deliver ahead of scheduled completion dates.

Unforeseen site conditions

It is not unusual for contractors to arrive on site and discover a number of unforeseen site conditions, many of which were not shown in the project drawings or covered in the initial project bid. Unforeseen conditions can include underground obstructions, utility lines that were improperly documented, misidentified soil types in the soil report, or unexpected water conditions. On a site that covers many miles, communicating these changed site conditions becomes a challenge.

Thankfully, productivity tools allow for sheet revisions and markups to easily be made and pushed to all members of a project. This allows them to document updated and changed conditions (especially dangerous ones) in real-time, saving money and keeping your team safe in the process.

The software tool you choose should update sheets in real-time. It should also offer markup tools that allow a user to indicate changes to a sheet and take measurements such as square footage of soil to move, how long sections of a road are and other useful linear measurements related to the project. Additionally, the tool should easily track differing site conditions from the field, making it easier for the Project Manager to create a change order and ultimately get paid for them.

Other actions you can take to reduce the risk of unforeseen site conditions include conducting a thorough site investigation prior to submitting a bid, adding a clause into the contract clearly identifying responsibility, understanding contract terminology clearly and how it impacts the project prior to signing it and promptly notifying the owner of unforeseen site conditions.

Equipment/fleet tracking and rental costs

Knowing where vehicles and equipment are located is a big part of streamlining efficiency on any project. The benefits associated with GPS are especially useful on megaprojects or large-scale civil construction sites that span across miles. When equipment can be easily located, it can be quickly dispatched exactly where it is needed. GPS construction devices and software tools help keep things more organized.

Fleet Tracking

On construction sites, fleet tracking is arguably the most common use of GPS technology. It helps track the fastest and most efficient routes to a project site—saving time and maximizing fuel economy, while avoiding traffic congestion. Ultimately, this translates to more time spent on the jobsite and less sitting in traffic. Fleet tracking tools also let you analyze patterns of where employees are traveling to and how frequently they do so. Understanding this data lets you make decisions as a company that improve your team's efficiency.

Equipment Tracking

GPS technology can also be added to construction equipment. If you're a construction manager or owner, you're most likely concerned about the security of your expensive tools and machinery. GPS tech helps you keep an eye on your assets from afar, helping locate valuable equipment quickly should an incident occur. For more insight on the impact GPS has on the jobsite, check out the PlanGrid blog post titled "**Location, Location: 4 Reasons Why GPS in Construction Matters.**"

Inefficient Use of Rental Equipment

Software tools allow you to keep your thumb on high-dollar rental equipment. When your team can better visualize the project site, understand changed conditions and locate every piece of machinery deployed—it enables them to use these expensive assets exactly when and where they are needed. An excavator sitting unused on a jobsite can cost thousands of dollars a day. Avoiding this type of waste has a substantial impact on the bottom line of a project.

Worker and jobsite safety

There are approximately 200 fatalities on heavy civil projects each year and the rate of injury and illness is roughly 2.8 percent.[6] Leveraging GPS tools can also provide safety benefits on the jobsite, specifically with the usage of hazard notifications and emergency buttons.

Hazard Notifications

High-risk features of construction sites like power lines can be accounted for with GPS tracking, as many systems offer the ability to place geo-fences around such areas to serve as a warning for workers to proceed with extra caution. Workers equipped with this technology will receive an alert from the system when they're about to enter these high-risk zones.

Emergency Buttons

Though GPS tracking systems exist primarily on equipment or fleets; some systems offer an emergency button that workers can carry with them on jobsites. These panic buttons function when a worker is in danger, but are unable to access their vehicle or phone.

Other current trends in construction safety include wearables, building information modeling (BIM), drones and virtual reality (VR). If you take a walk around a project site, you'll probably see these tools in action. As an example, drones can be seen hovering over most of today's project sites, safely capturing details from remote or dangerous areas in ways previously not possible.

Cost reconciliation delays often impact payments

Unit price contracts are common in infrastructure construction. When working with government agencies on contracts financed with public funds, any variations or unexpected costs must be justified with careful documentation—at least if you want to get paid for them. By using technology to digitally track quantities and create as-builts from anywhere in the field, you not only capture a transferable record of the work that was done, but you make it easier for owners and agencies to quickly confirm any claims that need to be made. The end result means getting paid faster.

Case Study: PlanGrid in Action in California

GRANITE™

Granite Construction is a premier Heavy Civil General Contractor headquartered in Watsonville, California. They began working on Highway 99 in Fresno, California to allow space for the new high-speed rail system. The project includes moving several miles of highway approximately 80 feet from the existing railroad tracks, relocating multiple local streets and utilities and replacing three bridges. The project will cost roughly $150 million when completed.

Communication on such a massive project is challenging. With multiple revisions and complications, there was a gigantic quantity of information to be managed. Prompted by the Department of Transportation's requirement that inspectors, engineers and field personnel have mobile devices for easier communication—Granite Construction went one step further and provided field personnel with PlanGrid.

The results were immediate and impressive. Having all the documents available exactly when they were required dramatically sped up communications. Meetings with field inspectors were no longer delayed while someone ran back to the office for a missing document. Plans and revisions were immediately available to everyone.

PlanGrid also kept the information transfer seamless between the day and night shifts and helped catch minor mistakes before they became major problems. On the Highway 99 Realignment Project, the lead Project Engineer found that the road wasn't graded properly to the latest specifications. PlanGrid allowed them to catch and correct the situation before it became a problem, preventing rework worth $40,000.

Granite Construction also opted to use PlanGrid for their Folsom Dam Spillway project. The company estimates that using PlanGrid on the dam project saved five hours per person each week and $500,000 in rework. Heavy construction projects like these require the best possible data and collaborative tools to reduce errors and make the most of the time allotted for the job.

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See a Live Demo

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PlanGrid construction productivity software is the easiest and most cost-effective way to get substantial return on your investment in construction mobile apps. By using PlanGrid you will:

- **Complete projects faster:** 90% of project costs occur in the field not the office and most can be attributed to time waste or delays. With PlanGrid, you can reduce wasteful trips to the trailer and time delays while eliminating costly rework with faster collaboration and communication.
- **Reduce costs:** PlanGrid allows you to optimize productivity in the field, which eliminates time waste that causes project overruns. By completing projects early or on time with Plangrid, contractors will benefit from reduced costs.

Try PlanGrid for Free

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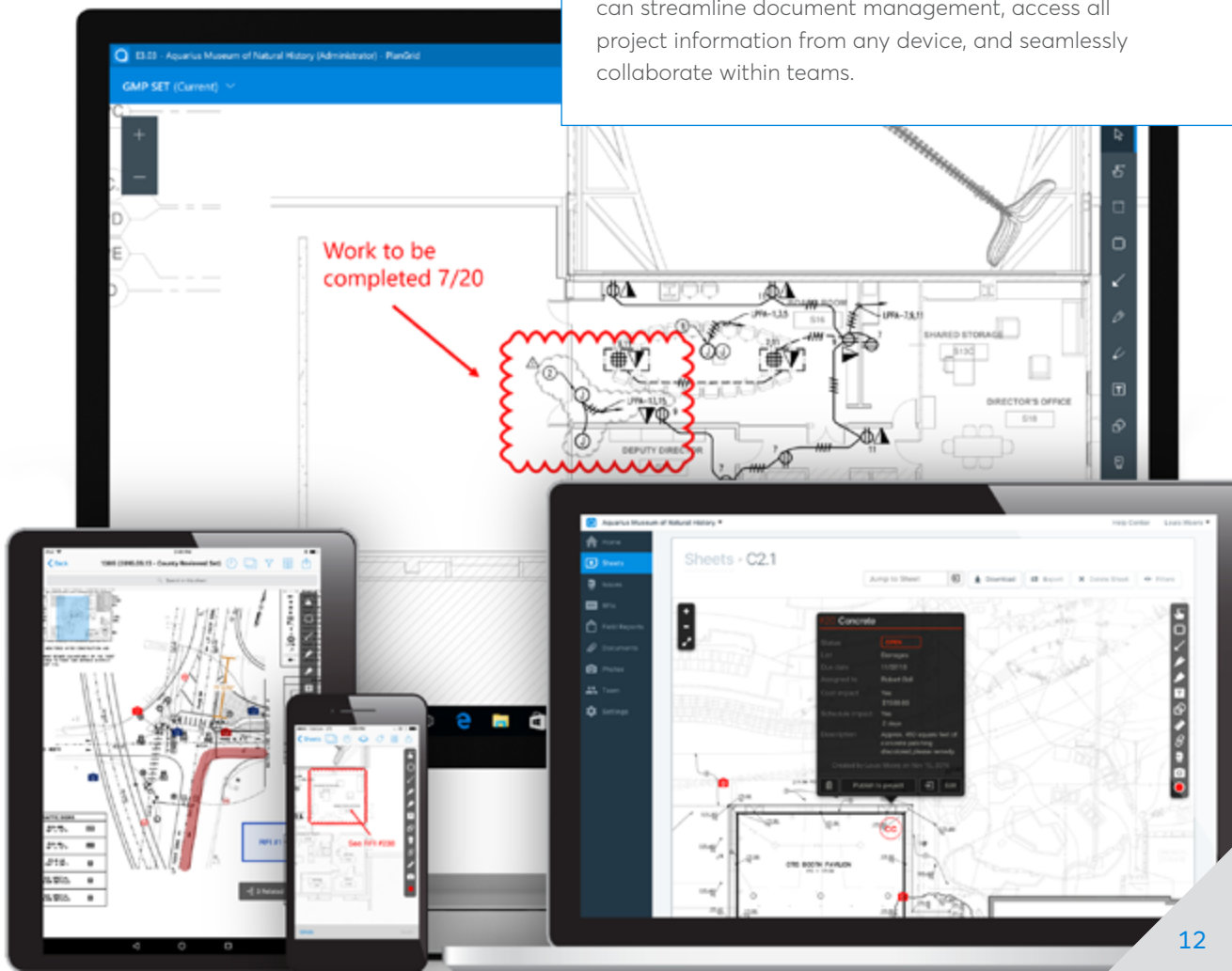
There is a reason why PlanGrid is not only the #1 construction app, but also the highest rated. With PlanGrid construction productivity software, you can streamline document management, access all project information from any device, and seamlessly collaborate within teams.



PlanGrid

Used on more than 1,000,000 projects around the world, PlanGrid is the first construction productivity software that allows contractors and owners in commercial, heavy civil, and other industries to collaborate, collect, and share project information from any desktop or mobile device through the entire project lifecycle.

PlanGrid increases project efficiency by streamlining document management, providing construction teams with easy access to all project information from any device, and enabling seamless collaboration within teams.

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