

A Design Build Company's Pain Points for Field Staff Working Outside of a Company's Home Area

Mason Barber

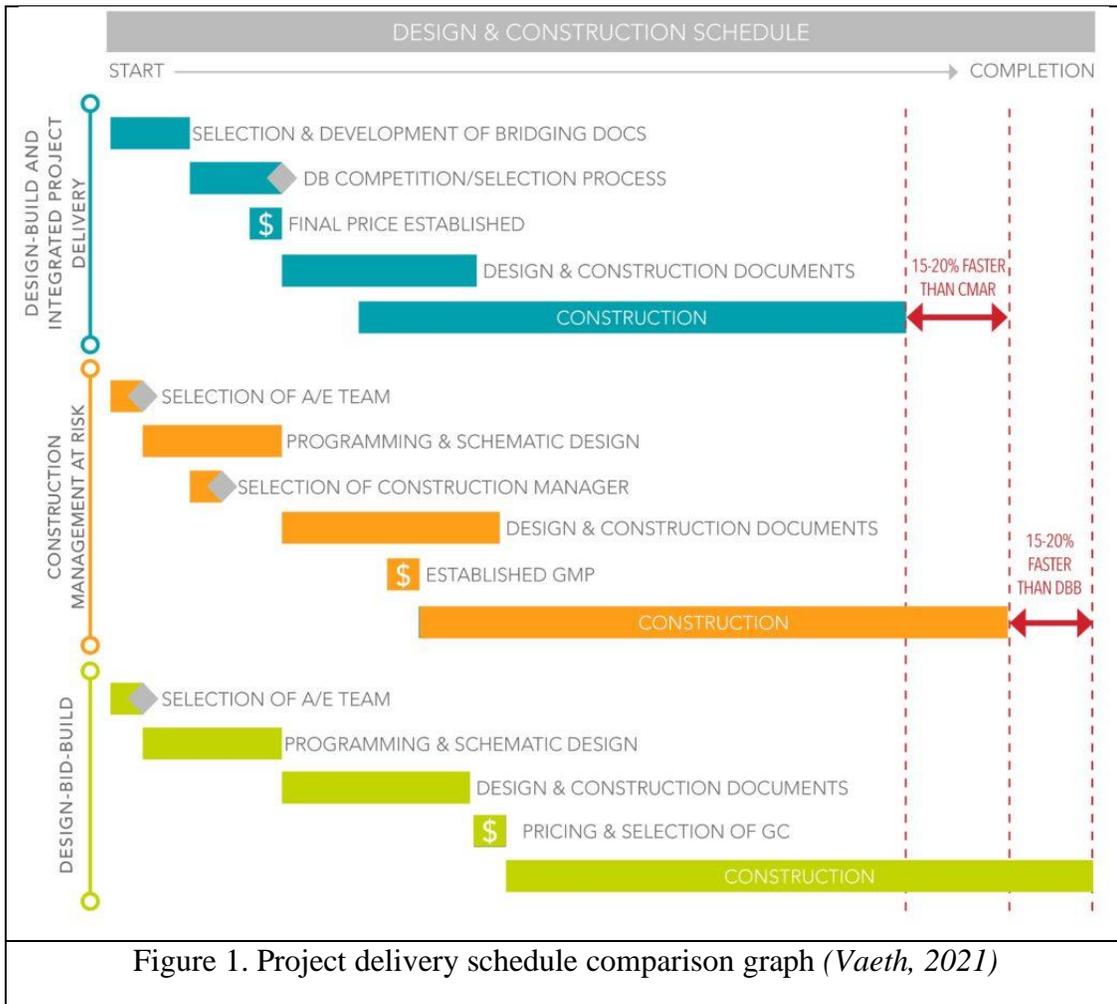
California Polytechnic State University
San Luis Obispo, California
December 2021

Design-Build is the project-delivery system of the future but is not without pain points. The Design-Build system is an efficient form of project delivery that has a strong focus on relationships and can begin the construction phase while the design phase is still active. This study aims to identify and analyze the additional challenges or pain points that arise when Design-Build construction is taking place in an unfamiliar location and distant from the company office. The pain points are identified with field staff feedback through the form of survey responses. This study uses The Neenan Company as an example because Neenan is a successful Design-Build style company that takes many jobs outside of their home region. The pain points identified with field staff survey input are compared against the Design-Build Institute of America's list of 10 best practices for Design-Build. This study found that the industry would benefit from more education on the practices of Design-Build for subcontractors and general contractor staff. This conclusion is based off of the primary pain point identified which was working with a new subcontractor base that often did not understand the differences of Design-Build construction from traditional construction.

Key Words: Design-Build, Field Staff, Pain Points, Traveling, Remote Construction

Introduction

Design-Build is often regarded as the project delivery system of the future. It is intended to integrate all relevant parties for construction and bring them on to the same team and page at an early phase in the project development. Ideally, according to Design-Build Institute of America (DBIA), the owner, architect, construction manager and major sub-contractors are all educated and familiar with the process of design-build and how it differs from other delivery systems. Design-build is fast tracked and necessitates constant collaboration both between the general contractor and subcontractors and internally between the architect and field staff of the general contractor. When the process is running smoothly, it delivers projects faster and is capable of handling complex projects easier than the traditional design-bid-build project delivery system is capable of. See Figure 1 below for a graphic display of the time savings for Design-Build from other popular forms of project delivery.



Neenan Archistruction is effectively a Design-Build company. They work with clients to provide start-to-completion design and construction services. Neenan is a mid-sized construction company located in Fort Collins, CO that builds projects locally in Northern Colorado and nationwide. The majority projects they take on are medical buildings such as hospitals, surgery centers, and clinics but they also work on commercial jobs and schools. They are a company that focuses on communication and internal relationships as well as establishing long standing connections with clients and subcontractors. Neenan is more than just a construction company as they also have in house designers and a real estate development team meaning they can work with clients in every stage of project delivery.



DBIA released a list of their 10 best practices for Design-Build construction, which is intended to help steer, the Design-Build process in a way they have seen to be most successful. (See Figure 2) Theoretically, when a company meets these practices the Design-Build system will run smoothly with these practices in mind, this research aims to look at what pain points arise and what best practices become more challenging when projects take place away from a company's home area. Pain points, for the purpose of this manuscript, are areas of work that complicate project success and day to day operations.

Literature Review

History of Design-Build

Design-Build may be the project delivery system of the future, but it is not a new concept. There are completed projects still standing that used a version of the Design-Build method that date back thousands of years B.C. Arguably the most notable of these ancient Design-Build projects would be the pyramids in Egypt. These were designed and built by a man named Imhotep. The Architect Institute of America defines Imhotep as a 'Master-builder' for his prowess in the design and construction process (Sell & Wilking, 2008). For large projects like the pyramids, it was common to be a pseudo version of Design-Build as the architects of the time were trained in the ways of construction. This trend of the master-builder being both the architect and 'general contractor' of a large project was not uncommon until the Renaissance when a second architect school of thought came about that desired for architecture to "align with the professionalism of art and law" (Sell & Wilking, 2008). Both schools of thought were still present but enabled some architects to focus purely on the design of the building while letting a builder focus on the constructability.

In America in the 1700-1800's, the prevalent construction school of thought for major projects was still having the architect as the principal contractor. They were tasked with designing the building and subcontracting out the building aspect to different trades. This process in early America was a similar version to modern Design-Build but did not last. The AIA cites five main reasons that design, and construction were separated in the 1900's. The AIA's five reasons are "a historic trend towards professionalism, the great depression/ World War 2, the Miller act of 1935, growth of professional societies, and an architect's aversion to risk" (Sell & Wilking, 2008). Four of the five reasons listed

are either external causes or products of societal pressure, but the Miller act complicated the construction contracting process. The Miller act requires contractors to post a payment bond to ensure that subcontractors and suppliers received payment on federal jobs. This complication raised the need to separate design clearly from construction as there were most steps required to construct a building and manage the contracts. It also limited the types of companies that could be and had to be bonded.

After the absolute separation of design and construction in the mid 1900's, it was not until 1985 that the AIA, the leading professional society of architecture, allowed Design-Build and provided the contract formats for Design-Build project delivery (Sell & Wilking, 2008).

Modern Design-Build

In modern times, Design-Build construction is when a single entity is responsible for both designing and constructing a project. Design-Build has most of the same elements of traditional Design-Bid-Build construction but the primary structure difference, according to Grace Ellis, is that the contracting is just between the client and the Design-Build group rather than a client having multiple contracts with an architect, and engineer, and a construction management group. As Ellis puts it, "One entity, one contract, one unified flow of work from initial concept through completion" (Ellis, 2021). Having the contracting simplified to just a single entity enables Design-Build to be a more collaborative process as the designer and constructor inherently work together as they are employed by the same company. Ellis also stresses that the collaborative culture is another fundamental element of differing Design-Build from Design-Bid-Build. Speaking on the benefits of having the designers and constructors on the same page Ellis says, "This culture of transparency helps immeasurably not only in clearing up misunderstandings but in avoiding the blame-shifting and mistake-making that can prove enormously costly down the road" (Ellis, 2021). Design-Build and the transparency that come from it is a notable asset to a client and enables the construction of complicated projects in a shorter amount of time than traditional construction. According to Chris Vaeth from McCowngordon construction, the time saving of Design-Build can be as much as 20-40% faster than Design-Bid-Build from the time saved on the front end of the project (Vaeth, 2019).

DBIA 10 Best Practices

The Design Build Institute of America outline 10 best practices for Design-Build companies to use as a template for the successful delivery of a Design-Build Project. The DBIA states that these 10 practices were compiled with two main thoughts in mind, "They are written to be universal in applicability, spanning any type of design-build project" and "They are important enough to directly affect project performance" (DBIA, 2014). With those objectives considered, the more of these practices a Design-Build firm can regularly achieve, the more likely they are to have successful projects. See Figure 2 below which is all 10 practices.

Procuring Design-Build Services

1. An owner should conduct a proactive and objective assessment of the unique characteristics of its program/project and its organization before deciding to use design-build.
2. An owner should implement a procurement plan that enhances collaboration and other benefits of design-build and is in harmony with the reasons that the owner chose the design-build delivery system.
3. An owner using a competitive design-build procurement that seeks price and technical proposals should: (a) establish clear evaluation and selection processes; (b) ensure that the process is fair, open and transparent; and (c) value both technical concepts and price in the selection process.

Contracting for Design-Build Services:

4. Contracts used on design-build projects should be fair, balanced and clear, and should promote the collaborative aspects inherent in the design-build process.
 5. The contract between the owner and design-builder should address the unique aspects of the design-build process, including expected standards of care for design services.
 6. The contracts between the design-builder and its team members should address the unique aspects of the design-build process.
- Executing the Delivery of Design-Build Projects:**
7. All design-build team members should be educated and trained in the design-build process, and be knowledgeable of the differences between design-build and other delivery systems.
 8. The project team should establish logistics and infrastructure to support integrated project delivery.
 9. The project team, at the outset of the project, should establish processes to facilitate timely and effective communication, collaboration, and issue resolution.
 10. The project team should focus on the design management and commissioning/turnover processes and ensure that there is alignment among the team as to how to execute these processes.

Figure 3: DBIA 10 Best Design-Build Practices (DBIA, 2014)

Methodology

For this paper, the data collection consists of two surveys distributed via email to Neenan Field staff. These were conducted to gain an understanding of the multiple perspectives of both local and traveling field staff on the pain points of the Design-Build process specifically with project execution. The surveys are attitudinal research meant to receive qualitative data. The main focus of this paper is to highlight the difficulties that come with performing the Design-Build project delivery system outside of the company’s home area.

The first and primary survey conducted by email over the summer of 2021 and was sent to Neenan’s field staff. This survey was done in partnership with Neenan itself as Neenan was also surveying staff for their own reasons. Only some of the questions on the full survey were relevant for this study. It was not mandatory to fill out or respond to. The responses that were returned were anonymous. The questions were a mix of short responses and rating ideas 1-10. The rating questions were aimed to get a general feel to a specific question and the short answer questions were left broader as to let the respondent relate it to their experiences. The survey results were collected and divided into local field staff and travelling field staff to look for differing trends. See Figure 4a below for the survey questions.

The second survey was sent out in Fall 2021 and was aimed towards the traveling field staff specifically. The questions were purposed with getting further explanation on the results of the first survey as well as receiving recommendations for ways to improve the process of Design-Build while travelling. The second survey also aimed to identify which of the 10 best practices published by the DBIA are the most challenging to achieve while doing Design-Build while travelling. See Figure 4b below for the survey questions.

1. Local or Traveling?
2. Has the office working remotely impacted your work positively or negatively?

- | |
|---|
| <ul style="list-style-type: none"> a. Short Answer 3. What aspects of project communication need significant improvement and how? <ul style="list-style-type: none"> a. Short Answer 4. I receive the information I need to do my job in a timely manner. <ul style="list-style-type: none"> a. Rank 1-10 5. How could the flow of information be enhanced to help you in your work? <ul style="list-style-type: none"> a. Short Answer |
| <p>Figure 4a. First Survey Relevant Questions</p> |

- | |
|--|
| <ul style="list-style-type: none"> 1. What do you feel is the most impactful or common issue that is specific to design-build construction away from Northern Colorado? <ul style="list-style-type: none"> a. Short Answer 2. Please click on this link to view Design Build Institute of America's 10 best practices. Which do you feel are the most challenging to meet when performing work away from Northern Colorado? (Practices 7-10 focus on project delivery.) https://www.bdcnetwork.com/10-design-build-best-practices <ul style="list-style-type: none"> a. 10 Choices to choose from. Can choose multiple. 3. Do you have any suggestions for ways to mitigate the issues raised when working away from Northern Colorado? <ul style="list-style-type: none"> a. Short Answer 4. Is there any processes or information that you have implemented in your work that has improved the overall practices for design-build work away from Northern Colorado? <ul style="list-style-type: none"> a. Short answer |
| <p>Figure 4b. Second Survey Questions for Traveling Staff Only</p> |

Results and Discussion

A note about the results: the pain points being discussed are primarily system based and not meant to be portrayed as a company based or of individual fault. The survey answers are meant to be compared against DBIA best practices and thought as process-based issues or areas for industry growth. This study is also meant to identify the`

1st Survey

The first survey was sent out to all Neenan field staff including both local and traveling employees, the most identified pain point was the desire to have more local work. The remainder of the survey was geared toward figuring out why that was besides just being away from home. The first question of this survey was asking the field staff being surveyed if they work locally in Northern Colorado or out of Neenan’s home region.

Question #2) Has the office working remotely impacted your work positively or negatively?

A question that was on the survey was mainly intended to assess the consequences of the office staff going remote due to COVID. The answers from the local staff were spread evenly between the impact of a remote office being either positive, negative or neither. Alternatively, this was not the case for the traveling field staff. With 55% of responses indicating a remote office had a negative affect on job site performance.

Question #3) What aspects of project communication need significant improvement and how?

The next question on the survey was asking field staff to identify their pain points in the flow of information. For the local staff, the primary breakdown in their eyes was the submittal process. This is a common view across the construction industry and many companies have been implementing document management technology to aid in this process. Acknowledging that travel staff likely has the same concerns with the submittals, the primary pain points in their eyes are that there needs to be more detail-oriented involvement from design, project management, and field staff in the preconstruction and design phases as well as more company wide implementation of document management technology. The survey results from travelling field staff had multiple mentions of front loading the project to check details more closely. These concerns are raised over major schedule delays in the field staff's history from incomplete details. There are multiple mentions in this subgroup of details involving building skin and thermal/moisture protection systems. While this is generally a complex building component, the lack of mention of it from local staff and the multiple mentions of it from the travelling staff leads to this being a primarily travel related issue.

Question #4) I receive the information I need to do my job in a timely manner.

Question #4 asked the field staff if they felt as though they received the information necessary to performing their jobs in a timely manner. The answers were on a scale of 1-10 with 1 being never timely and 10 being always timely. The overall average of this question was a 5.9 out of 10. While 5.9 seems lower than desired, part of the Design-Build process is that construction and design phases overlap so there is a period with construction happening with out a complete set of plans so always having the info needed to build is a natural challenge of Design-Build. The surprising part of this question's results is that the traveling staff's average answer was higher than the local staffs, 6.2 and 5.6 out of 10 respectfully. This means that Neenan office staff has a notion of the added difficulties of traveling staff and make an active effort to provide them extra support to make sure they have the info they need to do their jobs.

Question #5) How could the flow of information be enhanced to help you in your work?

The purpose of question #5 was different than the other 4 because it asked for possible solutions to pain points in the flow of information. The most common answer received was to fully implement their BIM software (PlanGrid) throughout office and field to streamline document and information management. This is a common theme in industry as BIM software has become very common over the last decade. This was pushed for especially by the travel crew as BIM software like PlanGrid can greatly increase their level of communication both on site and back to the office. One specific reason

cited was the ability to do a walk through of a project and have the ability to assign tasks through the software to the architect, fellow CM's, and subcontractors with ease. Implementing software like this in the setting of traveling design-build is especially impactful as it frees up the field staff's time to manage the other extra pain points they experience.

2nd Survey

This survey was distributed with a sole focus on the added pain points for traveling field staff rather than comparing traveling staff vs local staff. The desired responses were focused on naming specific pain points unique to travelling staff, assessing what DBIA best practices became challenging in this setting, and offering suggestions for mitigating the issues named as well as what processes they had personally implemented to do so.

Question #1) What do you feel is the most impactful or common issue that is specific to design-build construction away from Northern Colorado?

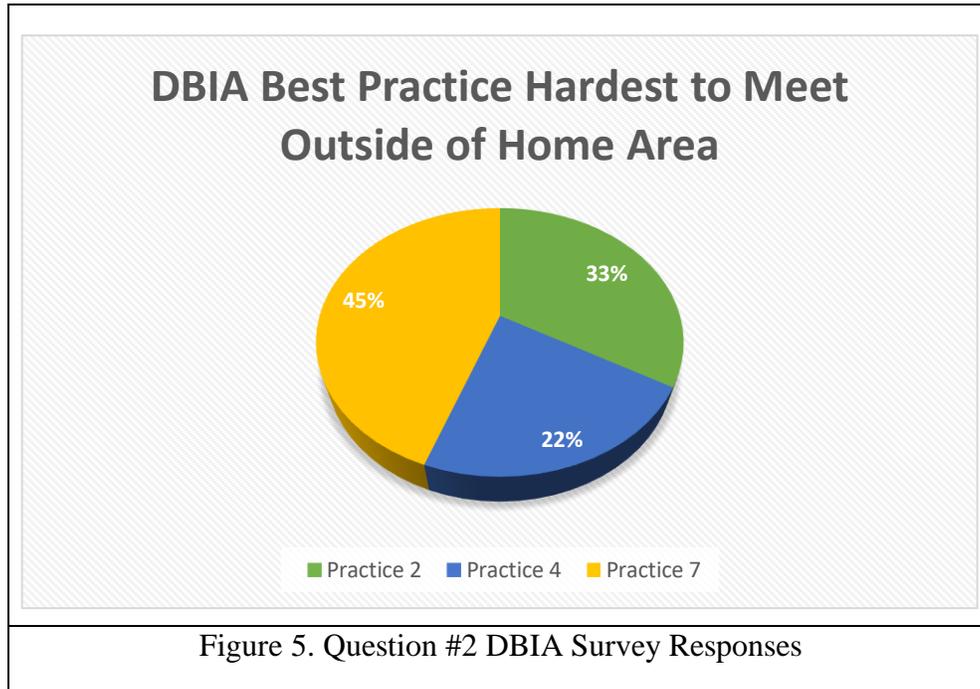
The first question asked what the travel staff felt was the most common/impactful pain point specific to Design-Build away from Neenan's home area. The survey answer that summed up the results the best was 'Establishing yourself in an area with a first time client, with new subs who you haven't worked with in the past, and ensuring that the area is big enough to support your job' (Survey respondent 2). To summarize, the biggest issue with performing Design-Build while travelling is the new relationships. This means that working with both new clients and new subcontractors raise pain points for the construction management of a project away from a Design-Build companies home area.

Question #2) Please click on this link to view Design Build Institute of America's 10 best practices. Which do you feel are the most challenging to meet when performing work away from Northern Colorado? (Practices 7-10 focus on project delivery.) <https://www.bdcnetwork.com/10-design-build-best-practices>

The question asked the survey respondents to identify which of the 10 DBIA best practices were hardest to achieve while travelling. The majority of responses indicated that practice 7 was the hardest DBIA best practice to achieve consistently on the road. DBIA best practice is "7. All design-build team members should be educated and trained in the design-build process and be knowledgeable of the differences between design-build and other delivery systems" (DBIA, 2014). This indicates that the biggest problem performing Design-Build services that travelling field staff encounter is a sub-base that is not properly educated in the design-build process. This point was summarized by one survey respondent saying 'Education is king. Whether it is from the organization to staff or from Neenan to the subcontractors on what the expectation is on their behalf.' It raises issues for the construction managers of design-build construction when the subcontractors do not know the process that they are expected to perform.

The other identified practices that have difficulty being met while travelling are DBIA practices 2 and 4. Best practice 2 as stated by DBIA, "An owner should implement a procurement plan that enhances collaboration and other benefits of design-build and is in harmony with the reasons that the owner chose the design-build delivery system" (DBIA, 2014). Practice 2 refers to the owner or client having a procurement plan that is in accordance with Design-Build collaboration. Best practice 4 from DBIA is stated as, "Contracts used on design-build projects should be fair, balanced and clear, and should promote the collaborative aspects inherent in the design-build process" (DBIA, 2014). This practice

focuses on the contracting for Design-Build groups with their clients and subcontractors. While these two duties are not part of the tasks of field staff for most companies, it is important to note that both practices deal with setting up the collaboration that is required for successful Design-Build construction and should be taken into consideration by companies performing Design-Build outside of their home area.



Question #3) Do you have any suggestions for ways to mitigate the issues raised when working away from Northern Colorado?

Question 3 asked what processes or tips could be considered to help mitigate the natural pain points that arise when performing design-build on the road. One answer from the survey simply suggested performing these projects in larger cities with larger labor pools. This response points out that the pain points identified throughout the research are even more obvious in less urban areas. Finding subcontractors versed in Design-Build construction can be challenging with a large labor pool but can be impossible when the labor pool only consists of a few options. One respondent continued to use DBIA best practices to shape their recommendations and put forth that to better achieve DBIA practices 4 and 7, there needs to be extensive training for all relevant Neenan staff involved on a project, both office and field, in the structuring and leveraging of a Design-Build contract. The respondent says that the contracts need to be written in a way that is equitable and create a team environment but also are presented to the subcontractor in a way that they understand this is not Design-Bid-Build construction. This is because the respondent often sees subcontractors attempt to shed the risk to the general contractor as they do in Design-Bid-Build construction.

Question #4) Is there any processes or information that you have implemented in your work that has improved the overall practices for design-build work away from Northern Colorado?

Question 4 asked for respondents to publicize any processes they had already implemented into their daily tasks that can help improve the practices of performing design-build while travelling. The consensus on the respondents that answered this question was that the implementation of the available technology has been beneficial in their day-to-day. This matches the consensus from the first survey as Neenan has recently made a push to use one standardized project management platform. One respondent says that having access to this program and being able to give Neenan's trade partners access to the program can majorly cut back on the time wasted finding the information needed for the project to continue.

Conclusions and Recommendations

The primary purpose of this study was to identify the pain points of performing Design-Build project delivery while the project is away from a company's home area and to analyze possible causes for the pain points. This researcher believes that the primary break down in the process is that when a company begins work in a new area with a new subcontractor base, there is generally not enough education on the process of Design-Build. This raises issues in the construction phase when subcontractors that primarily perform Design-Bid-Build jobs treat a Design-Build job the same. This researcher's recommendation is for Neenan and other companies performing similar jobs to create a Design-Build training program much like their safety programs. Integrating this training for team members in Design-Build specific processes would better enable Design-Build companies to achieve DBIA best practice #7. To this researcher, it would make sense to have a very in-depth program to train and re-train the staff of the DB company (such as Neenan) in the nuances of Design-Build and suggestions for mitigating the specific pain points for both jobs locally and while travelling. This training would be for both field and office staff as some of the recommendations from the survey cited the importance of the contracting process with Design-Build. To accompany that program, this researcher also recommends a training program for the project managers and foremen of the subcontractors to better prepare them for the Design-Build process and to ensure they are not treating the construction as if it is Design-Bid-Build. This would aim to mitigate several of the pain points identified with working with new subcontractors that are not versed in the Design-Build practices.

Another finding from this study is that the pain points that local field staff and travelling field staff encounter have some overlap that is natural to the process of Design-Build, but the travelling field staff encounter more pain points that can become more severe due to being away from the home area. This researcher noticed that Neenan makes active efforts to offer travelling staff extra support and timely answers. This researcher believes that Neenan has noticed the differences in challenges the two groups face and puts forth an effort to not make the travelling field staff feel left out to dry by a remote office. This researcher recommends that other Design-Build companies follow suit and allocate extra resources to travelling staff if they pursue any projects outside of their home area.

This researcher's final finding that applies to the construction industry as a whole is the implementation of a standardized project management software. Implementing this type of software is a trend throughout the industry and the study concluded that this is important for bettering the day-to-day of field staff both local and travelling. This software makes necessary documents such as plan sets and specifications much more accessible on the job site as they can be accessed via tablets. This researcher recommends that all construction companies integrate these platforms into their project

delivery. This researcher especially recommends these platforms for travelling Design-Build for the benefit of increased communication with a remote office.

References & Appendix

- A.C.E. (2021). What is design-build construction? Retrieved December 09, 2021, from <https://www.acebuildingservice.com/what-is-design-build-construction>
- DBIA . (2014, April 21). 10 design-build best practices. Retrieved December 2, 2021, from <https://www.bdcnetwork.com/10-design-build-best-practices>.
- Ellis, G. (2021, October 11). A guide to design-build construction. Retrieved December 08, 2021, from <https://constructionblog.autodesk.com/design-build-construction/>
- Sell, M., & Wilking, B. k. (2008, April 9). *A History of Design-Build. A Continuing Education Webinar*. Retrieved December 8, 2021, from <https://network.aia.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=d3e58630-ee7b-47c3-bcab-892355aeafa4&forceDialog=1>.
- Vaeth, C. (2021, March 30). Delivery methods analysis and comparison. Retrieved December 08, 2021, from <https://mccowngordon.com/delivery-methods-analysis-and-comparison/>