

A Case Study on The Use of Bluebeam on Commercial Construction Projects

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No matter the size, every construction project has their own unique characteristics and logistics that come with it. But one thing is certain, every project has a specific set of construction documents that include; contracts, drawings, specifications and other important information. To guarantee the overall success of the project, companies must find ways to be the most effective and efficient to reach their specific goals. Using a technological software such as Bluebeam allows companies to excel in what they do best. Using Bluebeam as their primary PDF viewer on construction projects allows them to approach their project with a positive mindset. By going paperless, it not only saves space on the jobsite but allows the company to be more organized. Especially in commercial construction where projects are much larger, the use of Bluebeam allows all documents to be kept on one software. In this case study, we will focus on a specific company that once did not implement the use of Bluebeam technology but now currently does. From taking advantage of this software we learn that it allows for effective project management within the company as well as gives everyone on the project team access to important documents at the touch of a button.

Keywords: Bluebeam, Project Management, Construction Documents, Commercial Construction

Introduction

Everyone has heard the saying, ‘a picture is worth a thousand words’, well that is definitely the case when certain problems arise on a construction sites. The ability to take a picture of your problem and redline the image on Bluebeam Revu saves time and money (FFKR, 2011). Launching in 2002, Bluebeam, Inc. is a software used around the world as a comprehensive tool in creating, editing, marking up and collaborating shared documents throughout various firms. Serving as an “industry-leading markup and collaboration solution that connects all projects and teams, setting the standard for design and construction professionals”. (Bluebeam 2002). Many people have found that the most common complaint between construction industries is the difficulty when requesting information or relaying the information to every member of the construction team (Ruikar 2007) From not having the valuable information at a specific time, problems such as reworking tend to occur due to the fact that the information was not received on time to the prospected parties (Fewings, 2005).

As far back as time goes, construction has been an aspect of life. Not only do we grow as humans, but so does the construction industry. Each year, the construction industry continues to revolutionize and so does the software that come with it. As projects become more complex, we depend on software such as Bluebeam Revu to help guide us in a direction of success. As a result, the ability to provide project teams with information in a collaborative way which can be accessed anytime and anywhere, allows project teams the ability to work effectively and efficiently (Lam and Chang, 2002) Many companies world-wide depend on a program that will not only help the overall firm but something that will help their projects run smoother with precision and accuracy.

General Background

Communication with everyone involved in the construction process is vital for a project's success. Finding a construction practice that allows for the owners, contractors, architects and engineers all to communicate more effectively allows for a smoother project. Being able to easily share information to all parties involved proves to be the best way to mitigate the risks that may come with complex projects (Weippert, 2003).

Another aspect of construction that is required for the project to run effectively is the overall collaboration and coordination that takes place between all the key players. As proven in extensive research, using a web-based program to communicate with the key players, has proven to be an essential form of communication company-wide (Yang, 2007).

Until the early 2000's, all construction documents were printed on hundreds if not thousands of papers. Even today, a good amount of construction documents is still distributed through printing and/ or sending them out to all necessary personnel. Although a bit more complicated, a more cost-effective solution to transferring documents amongst peers is through digital copies which allows for a more organized way of sending paperwork (Vileneuve and Robinson, 2003).

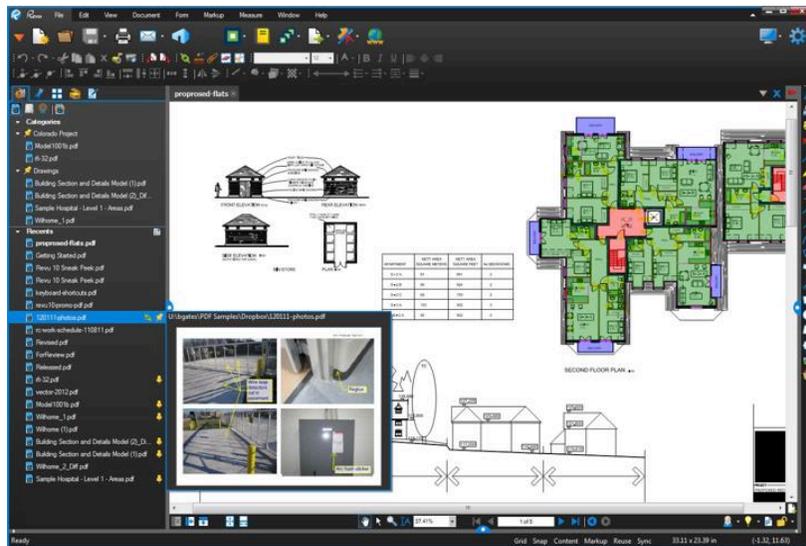


Figure 1 – Bluebeam Revu

Bluebeam's Impact on Construction Projects

Before 2002, without Bluebeam technology, construction companies would end up having to print out multiple documents pertaining to the project including; contracts, documents and drawings. Where things got complicated is when certain people had up-to-date plans while other team members tended to have missing documents and did not have the most current information. This posed as a liability to the company and the overall construction project because of accidentally building based of old plans.

Ever since Bluebeam came out, it allows construction teams the ability to have all their documents, specifications, contracts, drawings and any other necessary PDF documents all within one program. Thus, allowing the company to easily share documents within the company. A feature that Bluebeam has that is extremely helpful is the ability to hyperlink pages, so you can easily go to specific pages or specs at a click of a button. Rather than scrolling through the entire plans. Bluebeam allows people to markup documents and send out RFIs easily and effectively without having to worry about having the information lost. Bluebeam provides increased value for clients, allows for efficient planning and sequencing, provides easier collaboration for team members and allows for people to be interactive on documents (Hourigan, 2015). As technology continues to evolve, the ability to access vital information as fast as possible may be what sets companies apart from one another.

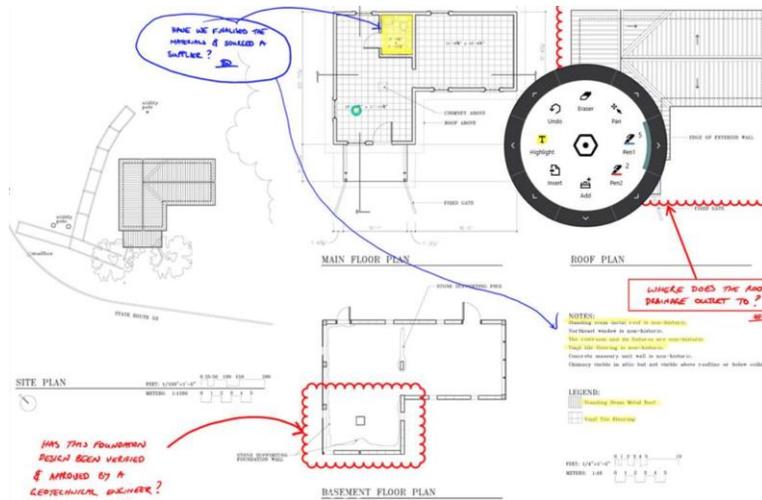


Figure 2 – Hand Marked Plans

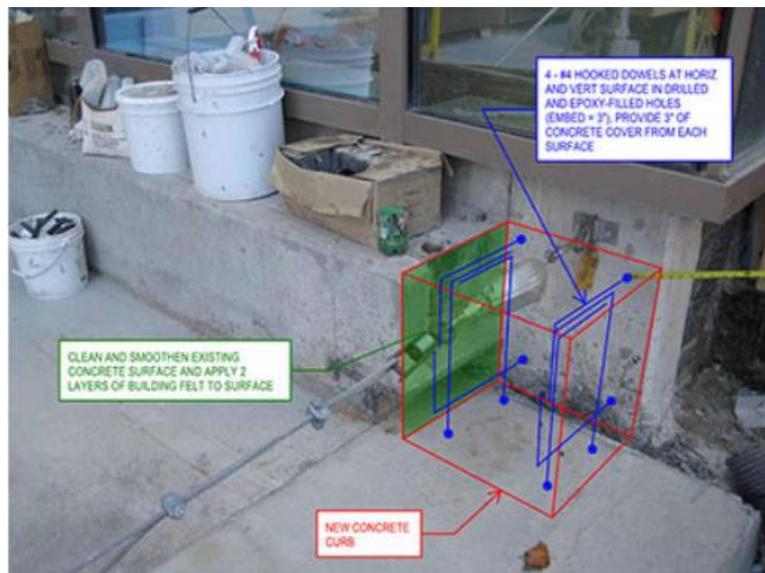


Figure 3 – Using Bluebeam To Communicate Issues

Methodology

The methodology I have decided to primarily use within this case study is to mainly focus on a specific company. From that specific company I would like to focus mainly on their experiences with Bluebeam Revu. Another main idea I would like to focus on is the before and after effects of using this specific software. Although difficult, my focus is to find a company that previously did not use Bluebeam software and now currently implement it into their company. I will specifically be looking for the benefits and detriments of Bluebeam software and I would like to directly apply my findings to the construction industry. I would like to present my result to various firms that may or may not use the software and provide valuable feedback from one company to another. A key focus on many construction projects is the schedule. I would like to find out how much time was saved by using Bluebeam technology, if there was a significant difference to the overall project compared to previous ones. The information that I find shall be relevant to any other construction company within the construction industry. Allowing the company to apply these benefits and detriments of Bluebeam technology to their own construction needs.

Through my methodology, my objective for this case study follows as such:

- Provide an overall better understanding of Bluebeam technology within the construction industry
- Analyze the specific benefits and detriments of using such software related to a specific company
- With the data collected in my research, I hope this helps other construction companies around the world in their decision whether to implement the use of Bluebeam within their company
- Lastly, I would like to show how a specific company uses Bluebeam technology to improve the overall flow on construction projects

Case Study

Although the company I have chosen to do this case study on allows me to share the information, they have asked me to keep their company's name private. So, for this case study we will give the voluntary company the name, 'Company X'.

Company X is an engineering company that is based out of Hawthorne, California. They have offices throughout California including the Central Coast, Los Angeles. Outside of California they have offices in Washington, Texas, Virginia and Florida. Coincidentally, just like Bluebeam, Company X was founded in 2002. The founder of Company X has always had a deep passion for record breaking technology. Like most who strive for excellence, he was an entrepreneur. Always trying to find innovative ways to improve and grow his company. It is cool to me because as both Bluebeam and Company X were starting out in 2002, they were both trying to find ways to revolutionize what they were working on. Until recent years, Company X did not implement the use of Bluebeam technology into their projects when they first started. Although Bluebeam still relatively new, the thought to use the technology never came across. Anyways, just like Bluebeam, Company X has grown immensely and as times continue to change, so does the industry. The use of Bluebeam within Company X has given them the opportunity to increase their overall productivity as well as provide grounds for an easier construction process.

Specifics of Given Project

The information I have received from Company X is based on a specific project that has taken place in Cape Canaveral, Florida. Originally constructed in 2008 and later reconstructed in 2016, due to damages, the overall project costs were \$140 Million. Although the project is roughly 20,000 SF, the overall site is 8 Acres. At first, when constructed back in 2008, Company X did not utilize the use of Bluebeam technology. But fast forward 8 years later, Company X has decided to incorporate Bluebeam software into the mix.

Furthermore, below I have provided the work breakdown structure that Company X has provided me with for their construction and reconstruction project in Cape Canaveral, Florida. The information provided is an excellent representation of the before and after effects of using Bluebeam technology within a company.

Construction project comparison with and without the use of Bluebeam

	Without Bluebeam	With Bluebeam
Year	2008	2016
Cost	\$ 40,000,000	\$ 120,000,000
Duration	8 Months	1 Year
Cost/Mo.	\$ 5,000,000	\$ 10,000,000

Figure 4A- Bluebeam Cost and Schedule Analysis

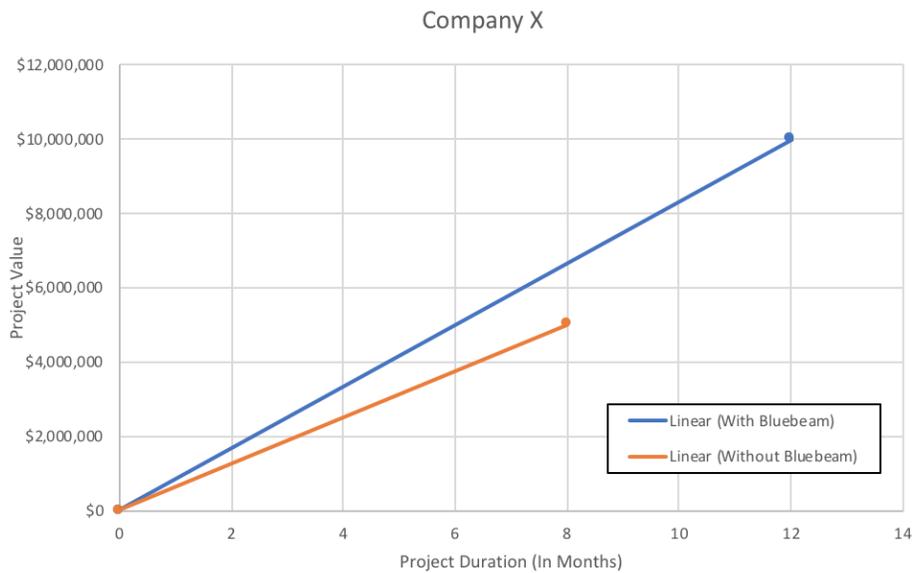


Figure 4B- Bluebeam Cost and Schedule Analysis

Analysis of Data

From the data presented above, we can see that there was a substantial difference between cost and time on both projects. Although the first project was completed in a shorter amount of time (8 months) and for less money, the overall project was a lot smaller. But if we look at the second project being 12 months with a substantially increased cost, we can analyze that utilizing the use of Bluebeam has helped. If we look at the second project, there was a much larger scope of work that had to be done. For a project with a price tag of \$120 million and to be completed within 12 months compared to \$40 million and taking 8 months is a huge difference. We can see that utilizing a software program that helps a company stay organized and communicate effectively can go a long way.

Positive aspects of Bluebeam

A noticeable aspect of implementing Bluebeam throughout the company is the effectiveness of communication and collaboration throughout the team. Bluebeam allows the company to go entirely paperless when it comes to viewing PDFs. Documents can be easily shared throughout prospective personnel. Another benefit that Bluebeam provides is the ability to easily edit/ markup any documents that are necessary. Implementing Bluebeam within the company not only helps with cost-effective solutions but may help the overall productivity of the schedule.

Negative aspects of Bluebeam

Although it may seem there are close to no negative aspects that may come with the use of Bluebeam, a couple have come to my attention. A noticeable detriment that comes with Bluebeam technology is its cost. There are three separate programs that you can purchase through Bluebeam being; Standard (least expensive), CAD (moderately expensive) and Extreme (most expensive). These costs range from about \$250-\$500. Although it may not seem extremely expensive individually, when purchasing the software for the entire company, costs can get high up there. Another detriment that comes with this technology is the time and energy it takes to teach the software to every team member. Some company's may not want to go the extra length to provide extensive training for the staff.

Improvements for Bluebeam

It is safe to say that Bluebeam technology has revolutionized the way PDF documents are viewed and shared. The only improvements that I deem may be necessary are the costs associated with the program and effectiveness for its new users. It is understandable why this program has the cost it has and there is not much you can do to improve it. Once users get the hang of using the program it is pretty user friendly. The only detriment is having to teach everyone how to use it.

Conclusion

As we humans continue to evolve, so does technology. What seems to be advanced right now, may be easily revolutionized within the next few years. Although Bluebeam does pose some concerns with its cost, it proves to be a vital aspect to the project team in the long run. Company's no longer needing to deal with over-crowded offices due to the fact of going paperless. Having a PDF viewer that allows you to access documents at the click of a button not only saves you time but saves money on the overall project. As proven with the data and statistics above, Bluebeam has shown to be a vital player in a construction projects success. Unlike other revolutionary construction practices that may pose as a benefit or detriment to the overall construction process. The use of Bluebeam may always be deemed as a benefit. As we know, the main detriment of this software is the training that comes with it. It may be difficult to train the entire construction team. But once that hurdle is surpassed, using Bluebeam is pretty

much smooth-sailing. With new technology that continues to arise, we can further a projects efficiency by keeping up with the latest software. As we know, technology in construction will continue to innovate, so who knows what may be in store in the years to come.

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