

[CS502402]

## [What Is the Truly Valuable DX for the Construction Site]

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### Learning Objectives

- With BIM360, achieve a new way of work to manage drawings even remotely
- Implement a new data management with PlanGrid to cope with sudden design/ specification changes
- Execute efficient VR interference check applied to large scale model utilizing Prospect
- Migrate to Autodesk Build achieving above mentioned solutions

### Description

For Digital transformation initiated by HQ, in order to make it work at on-site in real projects, we have been working on concrete measures. Understanding the capability of new technologies, we started closely working with Autodesk to realize "what we really want on-site".

When we tried to implement new technologies into the actual workflow, we had faced various obstacles, from very small to huge one, but we had to solve all of them in order to make it truly usable at on-site. After numerous trials and errors, our way of working has changed dramatically by moving all drawings and documents from paper to electronic (Plangrid), data from local to cloud (BIM360), and 2D drawings to 3D models + VR. Work efficiency related to drawings has improved by 30%, and we are now able to produce valuable outputs to our clients as well. We will talk about the challenges and possibilities for the future from a realistic point of view, because we are the person in charge at on-site

### Speaker(s)



13 years of experience as a site supervisor, in charge of construction sites of various "structures," "sizes," and "uses," ranging from large-scale projects such as a 16-story S-structure hotel with 350 rooms, to medium-sized projects such as a 3-story RC apartment building with about 30 rooms, to smaller projects such as a 2-story wooden house.

Everyday, I am passionate about digitally transforming construction sites.



Experienced in constructing 30 buildings in 17 years.

As a site supervisor on construction sites for a variety of building-use, including fitness clubs, high schools, and office buildings.

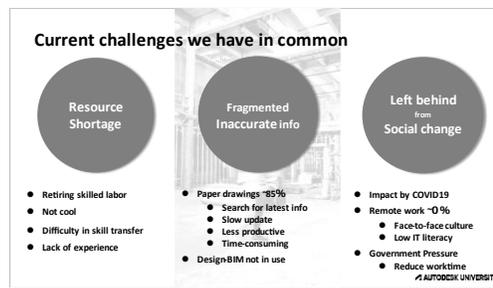
I am always thinking about how digital technology can change the way we work and what effect it will have on the company.

▪ **Three challenges in construction site**

**1. Decreasing labor force** at construction sites, a social problem

**2. Low productivity due to analog workflows;** still paper-based and lack of legitimacy due to data dissemination.

**3. Work-style reform such as Remote work** is expanded in general, but it has not yet been applied to Construction sites.



**“Digitalization of Construction site”** and **“Maximize BIM usage”** on top of the **“Cloud Platform”**, is the starting point for transformation of the construction sites. If any one of them is missing, it will be difficult to achieve our goals.

▪ **Enhance Communication method with BIM360**



**B** AUTODESK  
BIM 360<sup>®</sup> DOCS

Many parties involved in construction project faced challenges to have the latest data in place at all the time.

▪ When we noticed necessary drawings are missing on site, we had to go all the way back to the site office to print them out.

▪ Many PDF data were managed manually. It was very difficult to know which data was really the latest. Such situation often resulted in mistakes. It took extra time to make corrections.

With **BIM360 Docs**, we no longer have to go back and forth between the office and the job site. We have also achieved the paperless office.



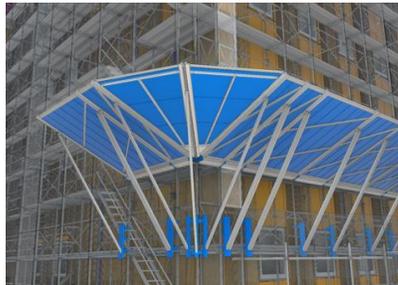
To check the interference and consistency of drawings, we collect many fabrication drawings and compare them with the construction drawings. Even though, creating a 3D image in mind, it requires a great deal of experience and knowledge.

Also, it was difficult to manage a large number of drawings submitted by the manufacturer at various timing. Even for members with enough experience and knowledge, around 40 or 50 checking errors had happened in one project.

Following advantages we saw by utilizing **BIM360 Docs**:

- ✓ Confirm through Web browser
- ✓ No Revit operation
- ✓ 2D-3D Integrated visualization
- ✓ Confirm attributes by Custom fields

3D design model can be viewed without having to learn Revit, making it easier to grasp the geometry. Model Coordination also allows us to automatically check for collisions in the model. We could eliminate the overlook in interference check.



## ▪ Digitalization of Inspection with PlanGrid

### Digitalization of Inspection



We inspect quality and patrol the site on a daily basis. We also conduct on-site surveys before construction begins and in post-construction maintenance.

- Photos and drawings are not linked in records. Many photos taken in the field look similar, and placing them in the correct position on the drawing is almost trying to solve a huge puzzle.

- We worked overtime to prepare paper inspection sheets, by writing inspection comments and instructions, and organize these data at the site office.

To solve this problem, we selected **PlanGrid** to link between photos and drawings, and to manage all data in one place.

- ✓ Easy to link Photo and Sheet
- ✓ Easy to create inspection check sheet and publish inspection report
- ✓ Utilize Cloud and manage all data in one place
- ✓ Device independent
- ✓ Real time information sharing
- ✓ Support many formats used on-site
- ✓ Application independent



統括安全衛生責任者による場内巡視記録 令和2年7月29日 (水)

安全点検項目	①	②	③	コメント	安全点検項目	①	②	③	コメント
1. 現場の安全衛生管理状況	○	○	○	清掃が行われており、安全衛生管理が徹底されている。	1. 現場の安全衛生管理状況	○	○	○	清掃が行われており、安全衛生管理が徹底されている。
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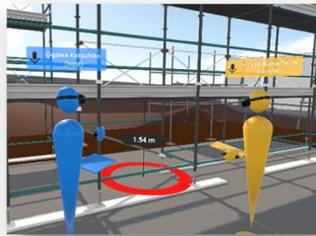


With **PlanGrid**, it covers easy to link photos and sheets, BIM integration, and centralized management from inspections to reports so that we can

- ✓ Centralize all inspection, patrol and survey records
- ✓ Integrate BIM with inspection, patrol and survey records
- ✓ Re-use of past project data
- ✓ Knowledge/experience shared in the company

## ▪ Apply VR in Construction sites

### Apply VR in construction sites



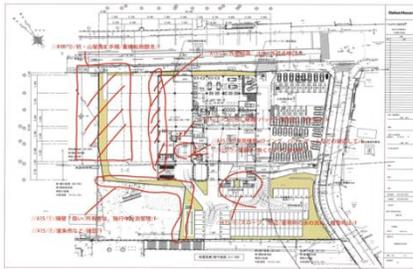
 PROSPECT

Reading and accurately understanding design drawings is very important.

Detecting errors and predicting issues at an early stage before they occur is a key to deliver good 'Products' to our customers.

However, it requires a high level of skill and a great deal of experience. It takes time to train newly joining people.

It impacts on the quality of our work.



For the client, you need to explain it in a way easy to understand for them to visualize the real thing.

It was a very difficult task.

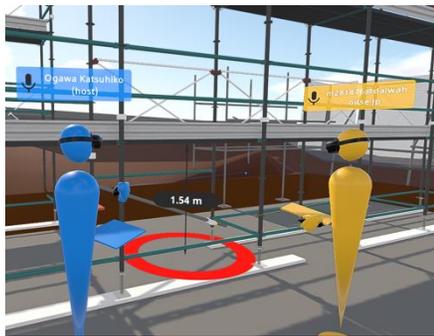
Among many VR products, we selected **PROSPECT** for its "compatibility with Revit" and "ability to view an entire building" as the most important requirements.

- ✓ Utilize BIM
- ✓ Visualize in real size
- ✓ Compatibility with Revit
- ✓ Phasing
- ✓ Large single building can be handled
- ✓ Easy to use on site

With **Prospect**, it is possible to understand information correctly in VR.

We can establish common images with the customer more accurately and quickly.

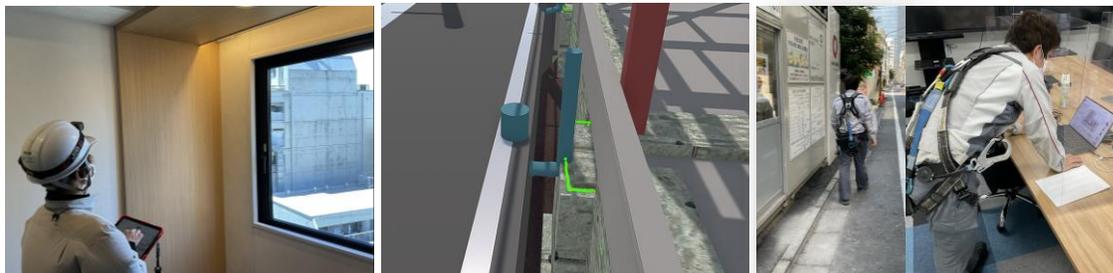
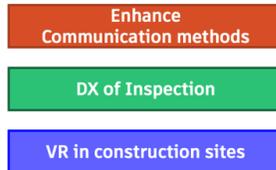
Also it contributes to significantly shorten the training period for new employees by experiencing a virtual site in VR. Even for skilled people, it is helpful to deepen their understanding on various building-use project in advance.



- ✓ VR simulation before construction begins
- ✓ More experiences within a limited amount of time
- ✓ Similar learning experience with real world can be gained
- ✓ Unknown details can be checked/experienced in advance
- ✓ Trainings can be done virtually

## ▪ Results from our attempts

"Enhance Communication methods", "DX of inspection" and "VR in construction Site", we have been working on as the first step in digitalization of the construction industry.



### [Increase Productivity with **BIM360**]

- ✓ Time to find drawings and print drawings were eliminated. It resulted in around 45-min savings per day, or 15 hours per month.
- ✓ It is now possible to manage RFI, attached drawings, response due progress status and activities, etc. all in one place, greatly reducing the time for RFI, increasing productivity by 35%.
- ✓ By using "Model Coordination", we could achieve zero check errors.

### [Digitalizing inspection with **PlanGrid**]

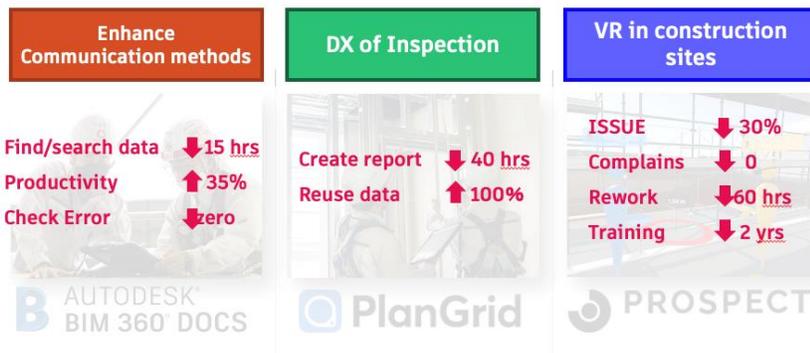
- ✓ Double work related to prepare report has been eliminated, saving 40 hours per month.
- ✓ All data from inspections, site-patrols, and surveys can be accumulated, 100% data reuse is achieved.

[Increase productivity by **Prospect**]

- ✓ ISSUE was reduced by 30%, saving 60 hours for correcting check-error per month.
- ✓ Customer complaints due to difference in image upon completion went down to zero.
- ✓ Also would contribute to shorten the training period for young staffs by 2 years.

## Our Case studies

Improve productivity on-site

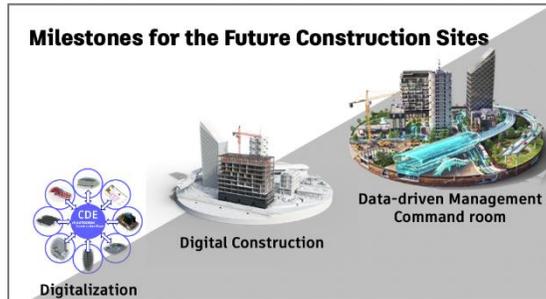


### ▪ Next STEP and our Future

Transformations accelerated by Digital technologies:

1. Creative workplaces attracting younger generation
2. Diversity in Construction site
3. Enhance Risk/Safety management
4. Labor saving, Unmanned operation
5. From BIM for Design to Const->O&M BIM
6. Contribute to Data-driven management
7. More Green, More sustainable

Embrace digitalization, enable digital processes, and collect digital data. And our efforts to evolve digital constructions, such as unmanned, labor-saving, and co-creation with robots, will go further and lead to the realization of data-driven management.



- **Closing message**

DX at construction sites has changed from *"nice-to-achieve"* to *"must achieve"*.  
Nothing will change if we keep staring at the roadmap without taking a concrete steps.  
With Autodesk, we have taken the first step of digitalization toward the construction site of the future.



We are currently in the process of migrating to ACC, Autodesk Construction Cloud.  
Next time, we want to share our chapter 2 toward bringing the construction site of the future to life!

=EOD=