AUTODESK UNIVERSITY

CS501742

The Power of Autodesk Construction Cloud Assets

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Symetri UK

Learning Objectives

- Learn how best to manage assets in Autodesk Construction Cloud
- See workflows between Revit, Autodesk Construction Cloud, and Power BI
- See how 360 photo capture can be linked to the Autodesk Construction Cloud platform]
- Learn about site management using Autodesk Construction Cloud Assets

Description

If assets are managed, they can become really important in any building project. You can use the information for progress tracking, evidence capture, asset data capture, linked data, and much more. In this session, you will see how you can use the Assets module in Autodesk Construction Cloud to benefit contractors and owner operators. In the United Kingdom, a new fire safety bill is being introduced. See how you can capture, store, and manage all fire-stopping evidence to meet the new building regulations. But assets do not have to be part of the building. See how site personnel, temporary equipment, and site management all can utilise assets to bring benefits to the jobsite. See how we can reuse the data in the new digital twin platform Autodesk Tandem.

Speaker

Johnathan Ward

Autodesk channel for 22 years

- Manufacturing
- Document management
- AEC space

12 years in Industry

- Construction
- Manufacturing
- IT

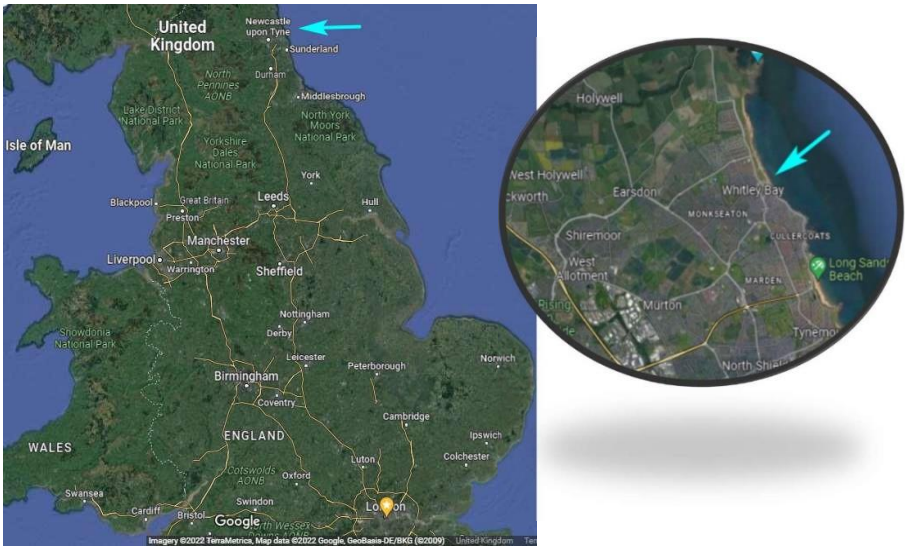
I am a consultant in Symetri UK's Construction Division, where my current role involves large-scale deployments of Autodesk Construction Cloud solutions and the ongoing management of client environments. I am highly active in providing a wide range of solutions to Symetri clients based around his understanding of their requirements and the solutions that provide the best fit with stated objectives. my broad knowledge of the major design and data management platforms ensures that I can recommend and plan the most appropriate path towards a successful outcome.

With 30+ years of experience in Construction, Manufacturing, and Technology sectors I have gained a detailed working knowledge of both the processes and workflow methodologies employed in achieving the optimum operational performance. I have a keen understanding of the challenges faced by businesses as they seek to improve working practices to maintain a competitive advantage in the marketplace.

A firm advocate of Building Information Modelling (BIM), I can guide businesses in the successful adoption of these technologies and provide informed advice to ensure the ongoing success of such projects.

I have also gained extensive experience in the electronic management and processing of data (EDM (Engineering Document Management)) throughout each stage of the design process, my practical skills enabling me to prepare protocols and standards for the specified design platform along with guidance on the effective use of the solution.

Most of my spare time is spent bouldering (indoor climbing) and kart racing, whilst also enjoying a range of musical styles, both listening to and playing (flute is my chosen instrument).



I live in Whitley Bay, in the far Northeast of England. Being able to walk by the sea every day is incredibly special.

About Symetri

Symetri helps innovative companies in the construction and manufacturing industry to optimise their working methods and increase the quality of their projects.

With more than 750 employees and 250,000 daily users in northern Europe and United States of America, Symetri can offer effective guidance in everything from 3D modelling and simulation to PLM (Product Lifecycle Management), BIM (Building Information Modelling) and how to maximise the potential of your project.

Many of our solutions are based on the principles behind Lean with benefits such as lower development and production costs, reduced material uses and shorter lead times, not to mention greater scope for creativity and better end results.

We have over 30 offices in Northern Europe and the United States of America.

Symetri is part of Addnode Group.

Why?

The drivers for us stem from 2 main sources: increasing client requirements, and new UK legislation. Although, simply using the assets module to its limit is justification in itself, capturing and maintaining valuable information through the design and construction phases, for use during operation.

Client Requirements

We are seeing an increase in the number of clients specifying an asset [as constructed] model as part of their deliverables, containing accurate information of all maintainable assets (COBie data as a minimum), to enable them to better manage these assets throughout operation.

UK Legislation

As a result of the Grenfell fire on 14th June 2017 there are 2 new pieces of legislation [UK], requiring more traceability and evidence pertaining to the safety of buildings:

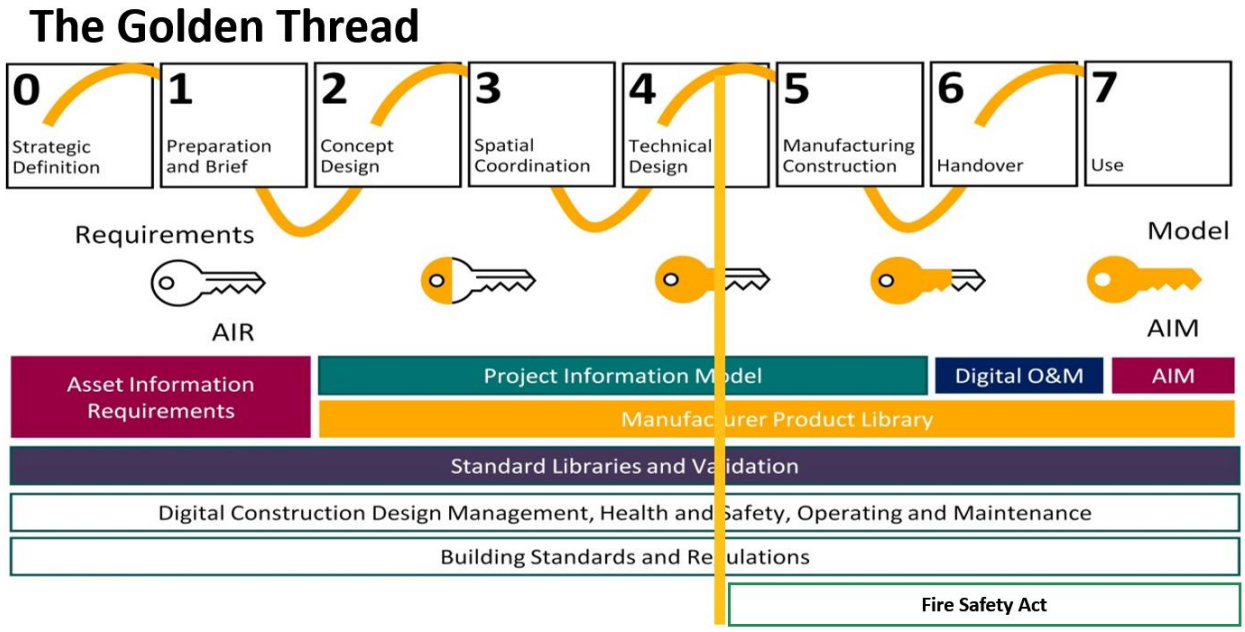
- The Fire Safety Act 2021

- The Building Safety Act 2022

Together, these have caused a re-think of current construction practices for high-rise residential buildings (HRRB).

Below, is an extract from the Building Regulations Advisory Committee (BRAC) golden thread report. It stresses the need for maintaining a "golden thread" of information through a building's lifecycle:

> *2.1 The government is introducing a new more stringent regulatory regime, for buildings 18 metres and over or 7 storeys and over, whichever is reached first, through the Building Safety Bill and proposed draft secondary legislation. As part of the more stringent regulatory regime, the government is going to require that duty holders and Accountable Persons for buildings in scope of the new more stringent regime create and maintain a golden thread, throughout a building's life cycle.*
>
> *2.2 The golden thread is both:*
>
> - *the information about a building that allows someone to understand a building and keep it safe*
> - *the information management to ensure the information is accurate, easily understandable, can be accessed by those who need it and is up to date*



There will be an increased requirement to capture [asset] information throughout all design, construction, and operation stages of the building lifecycle. BS 8644-1:2022 (Digital

management of fire safety information) details the information requirements relating to fire safety, in addition to the information requirements of BS EN ISO 19650

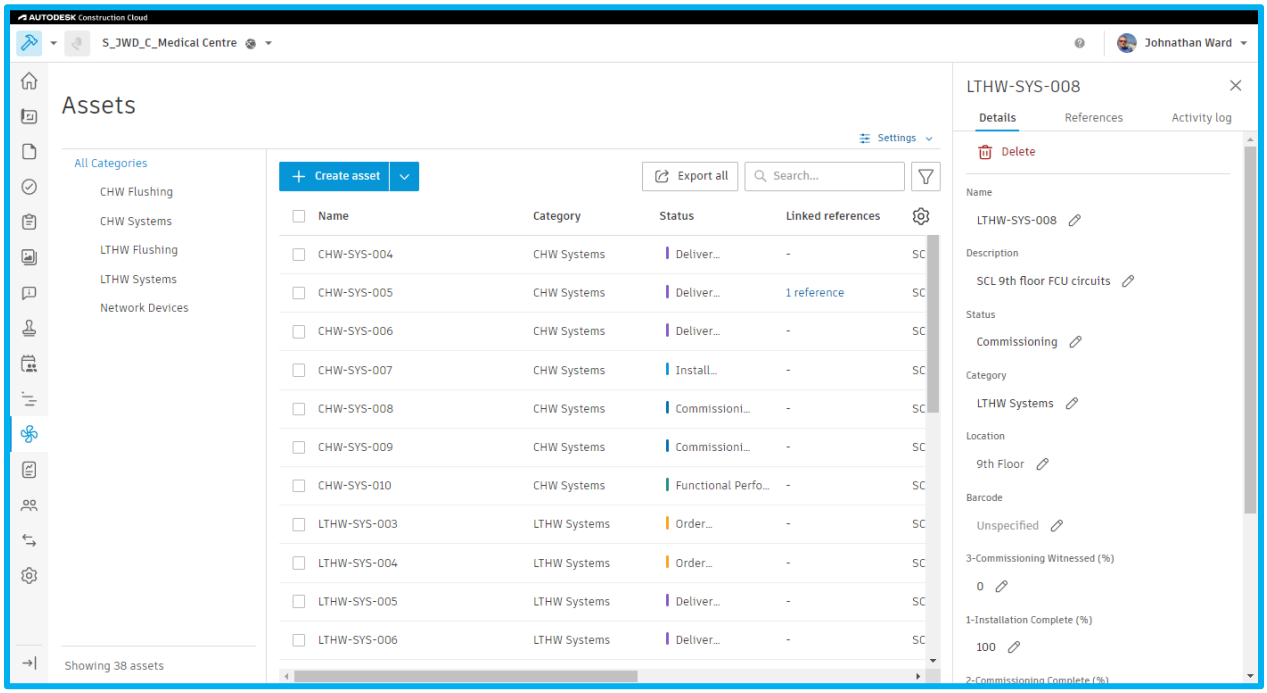
What is an Asset?

You will find many definitions for “asset,” but a better approach is to think about anything that we need to keep track of during the construction phase of our projects. The examples discussed here will hopefully give some insight into the many uses of the tool.

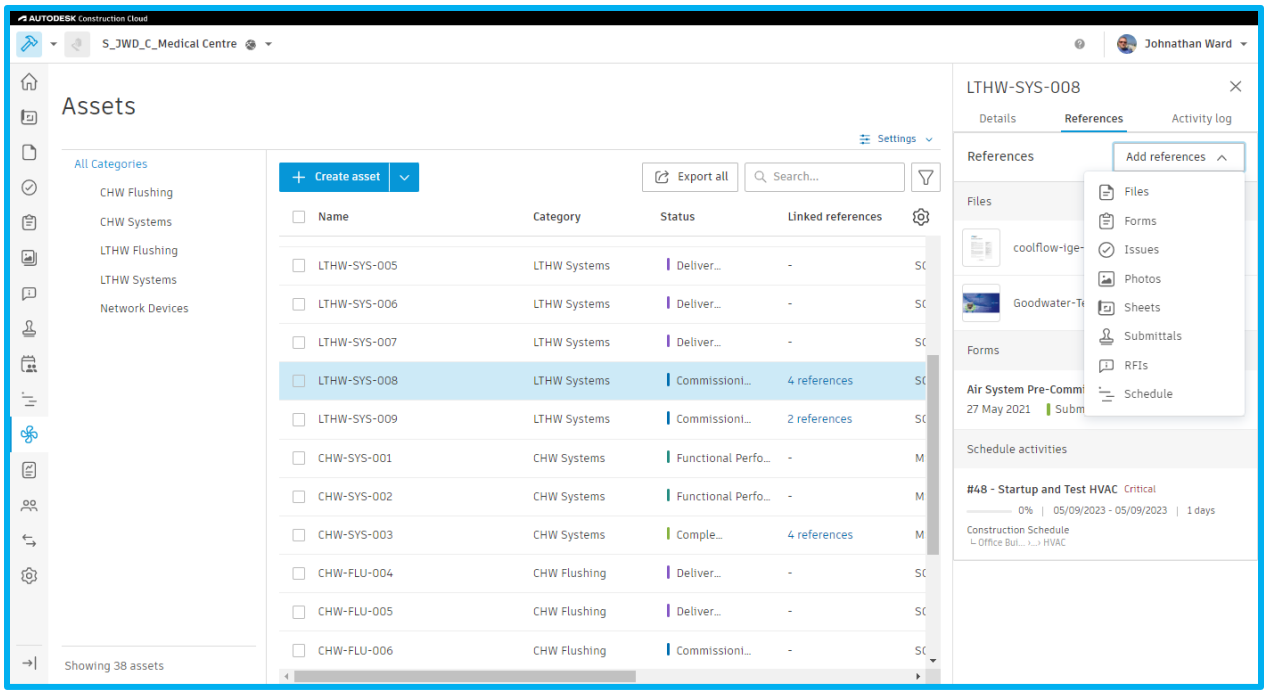
Managing All These Asset Types

How Assets Work in Autodesk Build

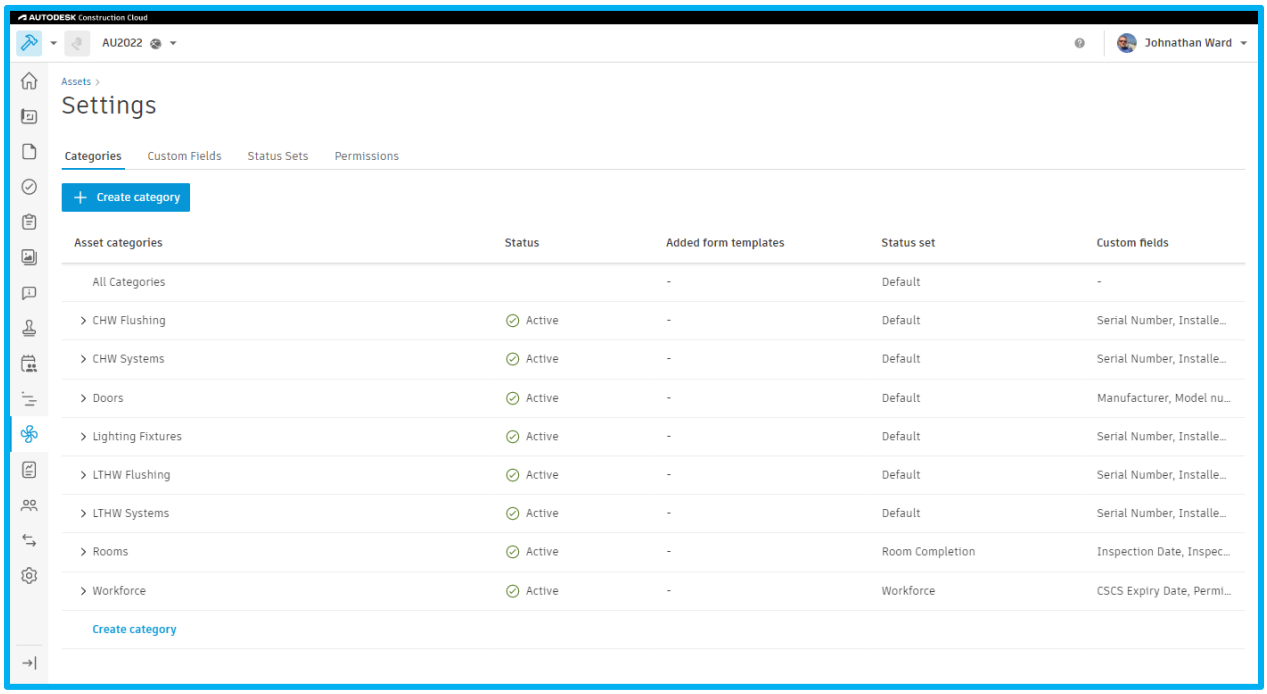
In essence, the assets module is simply a database in which we may store any number of entries, referred to as assets, and allows multiple attachments to be referenced from the other modules within Autodesk Build.



There are some standard settings that we can use (status set and basic fields to capture data), but most importantly we may create as many additional fields (referred to as custom attributes) and status sets as we require.



Additionally, assets can be categorised and against these categories [and sub-categories] we can specify custom status sets and attributes to suit the assets being tracked.



Asset Creation in Autodesk Build

The import option provides a robust way to add and amend assets in bulk. During the initial creation, the ID field will be blank, causing the system to create new assets. Subsequent updates are best achieved by first exporting a (filtered) list of assets, with all the specified custom fields and statuses, then re-importing after the amendments have been made in the spreadsheet. In this way, assets can be modified, and additional assets included in a single operation.

	A	B	C	D	E	F	G
1	B3F ID	Name	Category	Description	Location	Status	Barcode
2	604d0868-ed05-45e	LIGHTING FIXTURES-1	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657412
3	0b291f35-2b8b-402	LIGHTING FIXTURES-2	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657413
4	7a1b5df0-d5ea-45dc	LIGHTING FIXTURES-3	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657414
5	abc7c69a-06d1-43cc	LIGHTING FIXTURES-4	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657415
6	1677f8e3-4ad7-44ef	LIGHTING FIXTURES-5	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657416
7	6f2866f7-ea99-4d77	LIGHTING FIXTURES-6	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657417
8	9341644d-87b9-495	LIGHTING FIXTURES-7	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657418
9	51cdeafd-4d81-42d8	LIGHTING FIXTURES-8	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657419
10	15781fd3-05d5-44a	LIGHTING FIXTURES-9	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657420
11	71018f36-f1dd-432f	LIGHTING FIXTURES-10	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657421
12	0f85c8f1-9ecf-4e82-l	LIGHTING FIXTURES-11	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657422
13	4f7403c4-8b65-49dl	LIGHTING FIXTURES-12	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657423
14	81c1f5b2-4735-447l	LIGHTING FIXTURES-13	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657424
15	830accd3-e556-4f22	LIGHTING FIXTURES-14	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657425
16	1a3446e3-c9cc-4097	LIGHTING FIXTURES-15	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657426
17	58b52fe1-f59b-41b8	LIGHTING FIXTURES-16	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657427
18	ae97c18d-4e18-4c1c	LIGHTING FIXTURES-17	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657428
19	4e5bc827-c8e6-446	LIGHTING FIXTURES-18	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657429
20	8383b084-90c3-4d2	LIGHTING FIXTURES-19	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657430
21	e863f64e-3c14-4432	LIGHTING FIXTURES-20	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657431
22	3ed208dd-9935-44b	LIGHTING FIXTURES-21	Lighting Fixtures	2x2 3Lamp		Post-Accept	20004447657432

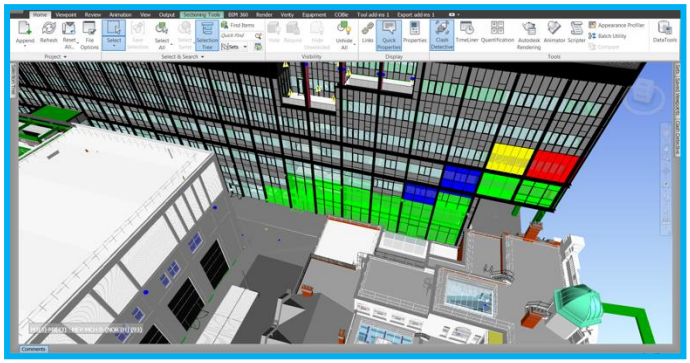
Industry Examples

Concrete Deck Pour

Here, each phase of the deck pour was treated as an individual asset. This allowed various checklists to be associated with each to ensure that all inspections had been completed before commencement of the pour.

Using a customised status set, the team was also able to monitor progress against the programme of works – in this case, using a series of Power BI dashboard.

Tracking Curtain Panels



Assets were again used here to enable the team to track and trace individual curtain panels being manufactured away from the construction site, in fact out of the country. Barcodes were assigned to each panel and the status set according to progress:

- In transit
- In UK
- Delivered (in lay down area)

Checklists were assigned to each panel (asset) for inspection and fixing, as well as assigning their “as constructed” location.

The statuses were extended to include stages of assembly, to enable progress tracking – this time using both Power BI and Navisworks

Workforce Management

In this implementation all site personnel were issued waterproof armbands with barcodes that could be scanned using the mobile app. This would then locate the correct asset in the register and identify whether the correct permits had been obtained for the work being done.

In reality, this requires a separate project to be set-up for these assets because of EU regulations: GDPR (General Data Protection Regulation)).

Plant and Equipment Management

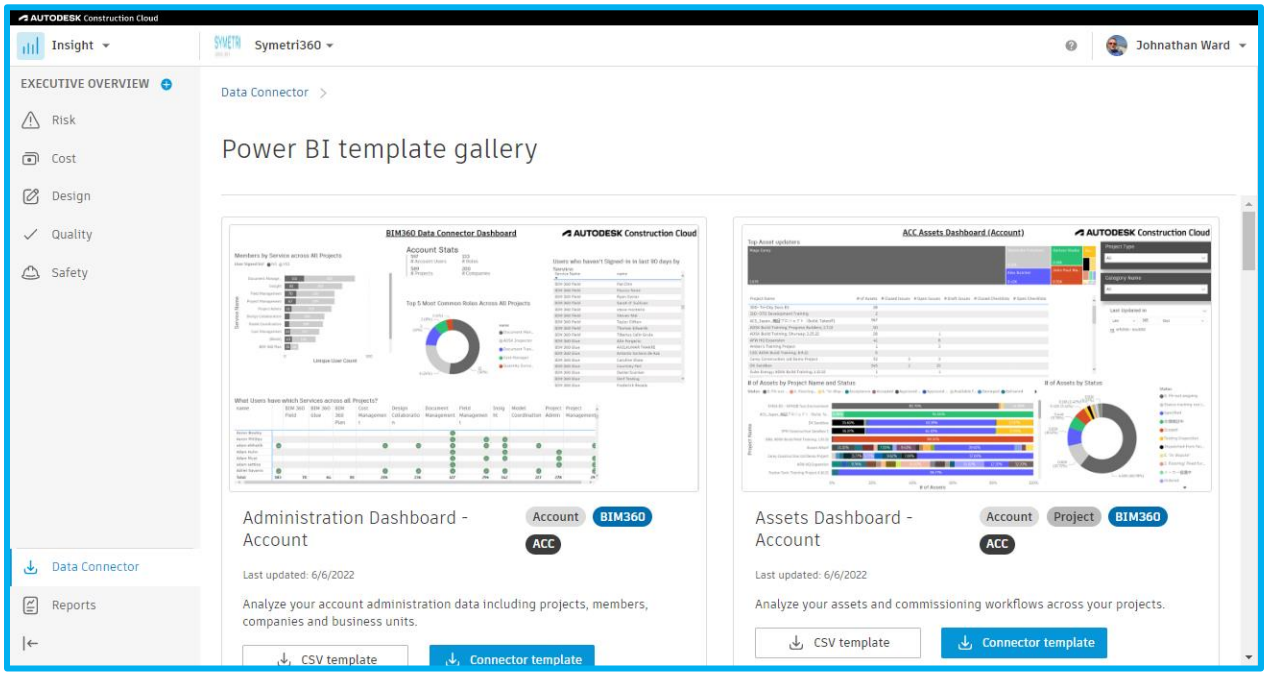
In a comparable manner to the above, each piece of equipment was assigned an asset and associated barcode. In this way each item could be both tracked through the site and flagged with any defects or damage and reported back to the hire company.

Power BI Dashboards

Power BI offers a uniquely visual way of presenting what could otherwise be unapproachable pages of statistics.

Autodesk Build provides a series of template dashboards for download, providing immediate access to the rich data contained in our projects. With the ACC (Autodesk Construction Cloud) Connector now built into Power BI Desktop, dashboards can be linked directly to your hub to access the most up to date information. Furthermore, by utilising your Power BI web portal you can schedule the updates to run through the night and distribute them automatically to your teams.

The templates also provide an excellent starting point for developing your own custom dashboards.



Site Verification

Going hand in hand with the collection and management of asset data is verification of correct installation and commissioning procedures, as well as progress tracking. This can be a very time-consuming process.

Mobile App

The mobile app (PlanGrid Build) provides access to the project data on phones and tablets (IOS, iPadOS, and Android).

The capabilities depend upon the type of licence subscription, detailed below:

PlanGrid Build Field Mobile App Capabilities

The following table details the mobile app capabilities for each offering:

Tools and actions	Build	BIM Collaborate BIM Collaborate Pro	Docs
Files			
Files and folders – Sync and download	✓	✓	✓
Files mark-ups – View	✓	✓	✓
Issues			
Issue List	✓	✓	✓
Issues (Sheets) – View, create, edit, delete – (iOS and Android)	✓	⊘	⊘
Members			
Member List	✓	✓	✓
Meetings			
Meetings	✓	✓	⊘
Sheets			
Sheets – View and download	✓	⊘	⊘
Sheets mark-ups – View, create, edit, delete	✓	⊘	⊘
Forms – (iOS and Android)	✓	⊘	⊘
Assets	✓	⊘	⊘
RFIs – (iOS and Android)	✓	⊘	⊘
Submittals	✓	⊘	⊘
Photos – (iOS and Android)	✓	⊘	⊘
Schedule	✓	⊘	⊘

Using the app, checklists and forms can be completed on the construction site, raising any issues as necessary, and capturing photographic evidence seamlessly.

It can also be used to scan barcodes and NFC tags to open the specific asset with all the information stored, as in some of the industry examples discussed earlier.

Oculo

Oculo provides a unique way of capturing progress during construction, using a 360-degree camera to capture the entire site and mapping that data back to floor plans, assets, and the 3D construction model.

Oculo talk of Capture, Compare, Collaborate as their 3-stage process, and the process really is that simple. More background is available on their website. Some case studies speak far more clearly of the benefits though, and I have included some highlights below.

Case Studies

Willmott Dixon

PROJECT: High rise residential block in London
USE CASE: Cladding & fire protection documentation
OCULO USAGE: Twice/week

"Having that 360 visual is a massive benefit to us as a business. When issues arise… we want to be 100% sure that we've done everything right and this underpins that"

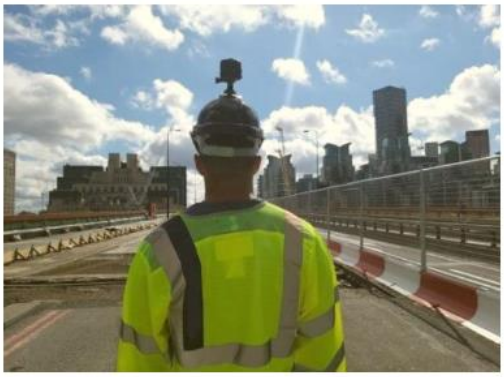
CASE STUDY

HB Reavis

PROJECT: Varso Tower (tallest building in the EU)
USE CASE: Supplier coordination and documentation
OCULO USAGE: Multiple times a week

"We have weekly meetings with 60+ teams. When I share Oculo on the screen, it immediately engages everyone, and saves us time and reduces potential for mistakes"

CASE STUDY



Ringway Jacobs

PROJECT: Transport infrastructure
USE CASE Renovation projects with fire safety elements
OCULO USAGE: Once/week

"Oculo helped us provide the site experience, but from behind the desk…It allowed us to triage an issue without having 13 people onsite looking down a hole"

CASE STUDY

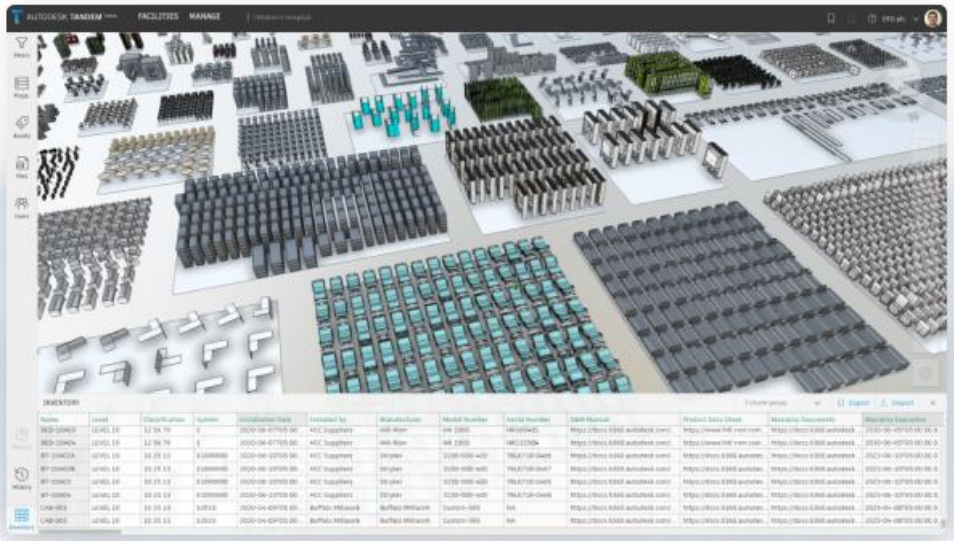
I would encourage you to check out their website (see useful links at the end of this document).

What Next?

Tandem

The logical place in this document for Tandem is here, although I would point out that the intent is that Tandem is deployed during the design phases to begin specifying the information required at handover, taking information in the Building Information Model, and forming the basis of the Digital Twin as the project progresses through construction and into operation.

There is an interactive testbed that offers a free insight to the platform and its capabilities, as well as an open API (currently in beta) for bespoke customisation, and more is on the roadmap, including a JavaScript software development kit (currently in alpha) and plug-in (flagged as future currently).



Useful Links

Technologies

Autodesk Build
https://construction.autodesk.com/products/autodesk-build/
https://construction.autodesk.co.uk/products/autodesk-build/

Autodesk Tandem
https://intandem.autodesk.com/

Oculo
https://www.oculo.ai/
https://www.oculo.ai/case-studies

Learning Resources

https://intandem.autodesk.com/resources/
https://knowledge.autodesk.com/support/tandem?sort=score
https://help.autodesk.com/view/DOCS/ENG/
https://help.autodesk.com/view/BUILD/ENG/
https://help.autodesk.com/view/BUILD/ENG/?guid=Data_Connector
https://powerbi.microsoft.com/en-us/learning/

Articles

https://www.designingbuildings.co.uk/wiki/The_golden_thread_and_BS_8644-1
https://www.designingbuildings.co.uk/wiki/Asset_information_model_AIM
https://www.legislation.gov.uk/ukpga/2022/30/contents/enacted
https://standardsdevelopment.bsigroup.com/committees/50291578#published
https://www.gov.uk/government/publications/independent-review-of-building-regulations-and-fire-safety-final-report [Dame Judith Hackett]
https://www.bimplus.co.uk/bs-8644-1-digital-management-of-fire-safety-information-an-information-management-perspective/
https://www.bimplus.co.uk/the-new-fire-safety-information-management-standard-explained/

Golden Thread

https://www.goldenthread.co.uk/
https://www.gov.uk/government/publications/building-regulations-advisory-committee-golden-thread-report

Legislation

https://www.gov.uk/guidance/the-building-safety-act
https://www.legislation.gov.uk/ukpga/2022/30/contents/enacted
https://www.gov.uk/government/publications/fire-safety-act-2021
https://www.legislation.gov.uk/ukpga/2021/24/contents/enacted