

BIM Excellence in the Public Sector

Grangegorman TU Dublin, Central & East Quad, Design & Build, Public Private Partnership (PPP)

Cillian Kelly, Head of Digital Project Delivery Dillon Johnston, Senior BIM Engineer



Grangegorman Development Agency Gníomhaireacht Forbartha Ghráinseach Ghormáin







Introduction

Overview of Grangegorman

DPD Strategy

Recommendations

Q&A

John Sisk & Son DPD Strategy

I had to be to

The Central Quad

The Central Quad Will be a centre of excellence for the Sciences. As well the Central Quad will accommodate academic activities and facilities required for a total of Ten Schools

The 10 Schools

- School of Biological Sciences and environmental Health
- School of Biological Sciences
- School of Chemical & Pharmaceutical Sciences
- School of Computing
- School of Mathematical Sciences
- School of Electronic + Communications Engineering
- School of Electronic Engineering Systems
- School of Food Sciences and Environmental Health
- School of Culinary Arts + Food Technology
- School of Hospitality Management & Tourism









The East Quad

Will be a centre of excellence for the Creative Arts & Media, the National Conservatoire of Ireland. As well the East Quad will accommodate academic activities and facilities required for a total of Four Schools.

The 4 Schools

National Conservatoire Of Ireland

School of Creative Arts + Media (Design & Fine Arts)

School of Creative Arts + Media (Media)

School of Languages, Law + Society

Employer Information Requirements (EIR)

3D Design Coordination Asset Management Data Management/ Classification Design Authoring via BIM Design reviews via BIM Space tracking for management & record Special Planning & Optimisation Visualisations & communication Laser scanning and Assets capture Engineering analysis Automated Digital Fabrication Bespoke BIM Object Library Construction Sequence and Simulation Cost Management





SISK DIGITAL PROJECT DELIVERY APPROACH





SISK DIGITAL PROJECT DELIVERY APPROACH





DIGITAL PROJECT DELIVERY INTERGRATION





3 DPD Strategy

John Sisk & Son DPD Strategy

Project "Building Execution Plan" Life Cycle





- Revised BEP was created upon Financial Close for the Construction
 Phase
- During the On boarding of Contractors during construction, the BEP was updated with any Bespoke agreements made
- With the development of BIM Standards within the Industry, we had kept our project standards aligned
- Coming towards to Handover, we created an As-Built BEP

•

• The BEP was then formed part of the Formal Handover of Documentation to the Client and the FM Team



Information Management – CDE





- One collaborative environment for all information with automated workflow functionality to streamline and manage information flow
- Viewpoint For Projects was used as our Cloud
 Based Common Data Environment
 - All Design Team Documentation
 - All Sisk FCC Documentation
 - All Sub-Contractors Documentation
 - > All RFIs
 - All Technical Submittals
 - Full Control of Approval Workflows
- Information was transferred from Viewpoint to the Client's CDE ASite upon agreed Stage Gates



Information Management – Digital Field Tool





- Filed View was used as our Cloud Based Field Data Capture
 - Customized Forms
 - ✓ Inspections
 - ✓ Snags
 - ✓ Walk Down W1, W2 & W3
- Reduce manual processes and human errors and significant reduction in use of paper
- Digitally Capture snags, H&S issues, inspections and reporting on Construction site
- Digitised Site QA and Client Handover
- Realtime reports and dashboards
- Analyse data to identify gaps and minimise future defects

V Field View



Design Authoring Via BIM





- All Building Design Models were developed in Revit 2016
- In 2019 we had investigated upgrading from Revit 2016 to 2019
- The decision was made to stay with Revit 2016
- The Landscape Model was developed using Vectorworks
- All Models were shared on a Weekly basis rigorously to ensure all Changes had been shared across the Team, We use a Model Transmittal Sheet to record Model Changes
- All Design Changes were logged in a tracker with Reference back to the Model Via Navisworks
- All Model Updates were logged in the Model Transmittal Sheet for Record

Design reviews Via BIM

- Design reviews had been carried out with the Client & Design Team in the pre-construction using Revit & Navisworks, this included
 - Room layouts Reviews
 - Furniture layouts Reviews
 - Equipment layouts Reviews
 - Mechanical layouts Reviews
 - Electrical layouts Reviews
 - Access and maintenance reviews
 - Way finding
 - Structural Layout Reviews





👯 | BIMcollab







Visualisations & Communication









360

VR



 Our Main software to create Walk Throughs was with the use of Lumion

communicate the Design back to the Client & Surrounding

On Grangegorman we had created numerous Videos to

- All Videos were edited in Adobe Premiere Pro
- We Used Enscape for all Internal Renders & 360 Images
- Utilization of QR Codes placed around the site & on drawings
- Various platforms had been tested on Grangegorman to ensure we were using the best product, allowing us to get the Best Output on our Visualise
 - Twinmotion
 - > Unity

Community

Unreal Engine

3D Design & Construction Coordination



BIMcollab



NAVISWORKS

🗱 sisk	Dashboard issues Model Lists Reports Import Settings								Q,	\$					
2902 - Grangegorman East Quad						Edd project. New project									
Clescription: Grangegorman East Quad Technical Un Christon: - Department: -	iversity Dublin Project owner: Dillon Johnston Open issues: 0	East Quad Model	Tracker	13/01/2021	REV P21										STOR STOR
		-	Rodal Name	-	Aspects	-	formed man of	erent Bankers Manage Bank	-	e. 100 - 100		-	van Alterated Scieller (n Bern	Sou of Sour	-
D D 0 0.00000000000000000000000000000000000	Departure Data Jahona Data Jahona		Another shares and a second se	all artiken and and and and and and and an	Областически Областически Афреба Албона Солотора Солотора	Accession of the second s							Image: second	2	of Company and

- The Grangegorman 3D coordination commenced in early pre-construction phase and carried all the way through construction phase,
- The process was managed by 1 BIM Manager & 1 BIM Engineer
- We started the Coordination through Navisworks capturing viewpoints and sharing via Excel Tracker
- We then carried out a business level review on a cloud based Issues management System to stream line and have record of all issues capture across the business.
 BIMCollab was the software choosing to be our centralized system.
- Grangegorman was the First Major Project to adopt BIMCollab with Sisk and our current setup has been derived from the lessons Learned from GG.

Automated Digital Fabrication / DFMA



- On Grangegorman we had aimed to Off-Site Fabricate as much as we could
- We were able to Off Site Fab many part of the Building
 - Pre Fab Façade Panel
 - Pre Fab Window Units
 - Steel Atrium Stairs
 - Pre Cast Stairs
 - Pre Cast Cores
 - Pre Fab Steel Framing for East Quad Performance Hall
- To allow us to do this Off-Site Fabrication it required some heavy coordination to ensuring no issues when delivered to site
- Initially the design was developed in Revit and then transferred into Teckla for the Fabrication Model



Construction Record / As-Built Model



- During Construction it was outlined to Progressively Red Line Drawings as the Method of Tracking As-Built
- The Red Lines drawings were then updated on the Master Red Line within the Contractors Site Office
- Once an Area had been completed on site the information was updated within the model
- Once all information had been added to the Model we carried out a Final Clash Test to ensure Model was Clash Free
- Issues found that could not be resolved within the weekly BIM Meetings or along side using Holobuilder, a site walk was organized to review the site conditions.
- The Master Information Delivery Plan was used to pull coordination dates and tracked on a weekly basis



Digital Project Management & Reporting



- Industry Development has proven that Data Insights are key to understanding our projects and making better decisions
- I had seen the benefits to Data analysis in mid 2019
- Learning & adoption of Data Gathering, Cleaning and Reporting was carried out on certain aspects of the Project Data
- Development of Excel Trackers to aid in Progress Reporting / Tracking
- Lessons learned in regards to un-connected datasets
- Increased data insights were formed for better planning and decision making



IIIIIIIIIIIIIII



Space tracking for management & record





- During Covid19 Pandemic Majority of sites had been shut • down bar Projects deemed essential.
- Our current method of image capture was through the • use of Filed View Still Images.
- We chose to implement the use of 360 Images to reduce • quantity of conventional still images.
- With this new method of image capture we had ran into • the issues of Storage and Version Control, this is where we rolled out the Use of Holobuilder.
- Holobuilder with its Centralised Cloud Storage Capability ٠ allowed us to accurately capture images, pin to a floor plan, and shared with entire project Supply Chain
- This reduced all sorts of Onsite Visit & Travel for 70% of our Supply Chain



Asset Management "COBie" & CAFM / CMMS







sodex plan







- For the this Project, We Partnered with Sodexo, where Sodexo would Maintain the Building for the Next 25 Years
- The BEP Outlines the High Level Requirements for Data • Exchanges & Non-Graphical information
- During this Project we worked very closely with Sodexo to develop the Project Asset Information Requirements "AIR"
- During this Phase which last several months agreeing the Requirements with Both Sisk & Supply Chain and Sodexo, we came to a final set of requirements, documented in the AIR
- Over the course of 12 Months and approx., 1500 • working hours on my behalf we were successful in delivering an As-Built, with fully approved Non-Graphical Data, where these models had been imported into the Asset Information Model

Design through Digital | Grangegorman











Recommendations

John Sisk & Son DPD Strategy

Ensure DPD Deliverables are clearly Stated in Contracts

Be Clear with Supply Chain on Deliverables

Early Engagement with End User

Ensure Supply Chain has the correct capabilities

Bring People on the Digital Journey

Mistakes Happen, Deal with them Effectively





Thank You..





Cillian Kelly, Head of Digital Project Delivery Dillon Johnston, Senior BIM Engineer





Irish Construction Excellence Awards 2022 Finalist