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Using BIM 360 As an Educational Platform and Feedback Tool to Facilitate and Enhance Multidisciplinary Team Collaboration and BIM Education and Assessment

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Learning Objectives

- Discover the educational use of BIM 360
- Learn about collaborative BIM education
- Learn about the management of BIM educational programs
- Discover lessons learned in BIM education

Description

TU Dublin's Multidisciplinary Collaborative BIM Postgraduate Project forms part of a wider MSc in applied Building Information Modelling & Management. The participants in this project come predominately from Architecture, Architectural Technology, Construction Management, Quantity Surveying, Structural and Building Services Engineering, backgrounds with between 2 and 25 years of experience.

Prior to undertaking this project, students had gained significant experience of discipline-specific BIM technologies, model federation, cross-disciplinary understanding and aligned areas such as Dynamo, Lean & AR. All students had also gained an in depth knowledge of BIM processes and workflows, focussing mainly on ISO 19650 standards, but also covering current PAS standards, Government Soft Landings, and the CIC BIM Protocol etc.

With the lecturing team acting as Clients, multidisciplinary teams of 4-5 students were

formed and provided with a very detailed Exchange Information Requirement (EIR), Project Brief, Project Specification and Project Information Requirements (PIR) for a new University campus project.

Each team comprised a different mix of disciplines thus resulting in the creation of different BIM Execution Plans (BEPs), utilising the specialist knowledge available within each team. The teams interfaced with client representatives in the form of a BIM Information manager, an architect, and a construction manager and pulled expertise from within their peer group. TU Dublin staff and external specialists were also used to address issues of building regulations, sustainability, incorporation of Lean Principles, and adoption of an agile project management methodology.

The stipulated use of Autodesk BIM 360 within the EIR was used firstly as a CDE for each design/client team and also to accommodate cloud collaboration, communication, design, coordination and clash resolution. The use of RFI's, Submittals, Reviews and Activity Tracking further allowed the platform to be used as an educational tool to provide real-time feedback, comments and mark-ups on documents, models and concepts.

Following the review process, every file was further assigned a quality status of (Approved, Approved with Comments, or Rejected etc.). This enabled each team and individual discipline specific member the opportunity to revise any files not meeting the required standard or level of information need, before being allowed to progress to the next Plan of Work stage.

A client published area was also set up within BIM 360 to facilitate the required team data-drops and PIR's at each stage stipulated within the EIR. Now in our second year of utilising BIM 360, findings have shown that as well as properly set-up CDE and cloud collaboration platform, BIM 360 also worked exceptionally well as an educational tool that can be used for quality feedback, learning monitoring and assessment.

Speakers:

Kevin Furlong is a lecturer in BIM and Collaborative Digital Construction at the Technological University Dublin's School of Multidisciplinary Technologies. From a Building Services background, Kevin has worked in industry in a variety of construction and building services roles, before becoming an educator in a full-time capacity. Kevin holds a Masters degree in Higher Education and also a Masters Degree in BIMM. He is also a Autodesk Certified Professional

With colleagues from across the College of Engineering & Built Environment, Kevin was responsible for development of TU Dublin's ground-breaking MSc in applied Building Information Modelling & Management, and he now teaches across a range of discipline-specific and multidisciplinary modules as well as supervising applied Capstone projects.

Kevin leads and coordinates the Multidisciplinary BIM Collaboration module where this project work is undertaken. He is an active member of the both the UK and Irish BIM Academic Fora, and has a leading role in TU Dublin's College BIM Strategy Implementation working group.

Emma Hayes, is Managing Director of Digital Built Consultants. A leading Building Information Modelling (BIM) and Digital Information Management consultancy firm who support and guide clients from the Architectural, Engineering, Construction and Owner-Operated (AECO) industry throughout their digital transition and BIM adoption journey. Emma has over 20 years' experience in the AEC industry in Ireland and internationally. She is a Chartered Architectural Technologist and holds a Bachelor's Degree in Architectural Technology from Technological University Dublin, and a Master's Degree in BIM Management from Middlesex University.

Previously, Emma was the Group BIM Manager for a large multi-disciplined AEC and Project Management organization. She was responsible for the development and implementation of the Group BIM strategy and roll-out of procedures and workflows for BIM adoption across the organization's network of offices in Europe, Asia and the US. She has executed BIM on a number of high-value complex projects in the pharma, food, energy and mission-critical sectors.

Emma is actively involved in driving progress in BIM adoption in the AEC industry. She is a non-executive director on the board of the Construction IT Alliance and is actively involved in buildingSMART (bSI) UKI Steering Committee for OpenBIM Certification. She has presented research papers at international conferences such as the CitA BIM Gathering and is on the

Judging Panel for the BIM Excellence category at the Irish Construction Excellence Awards. She mentors and supports the development of women's careers in BIM through her role as the Irish Regional Leader for the Women in BIM (WiB) network. She is also a part-time lecturer on the MSc Applied BIM Management, TU Dublin and the MSc BIM Management, Middlesex University.

MSc in applied Building Information Modelling & Management

Level 9 Programme – Part-time over 2.5 Years (3 Year Option)

Overall Structure:

Stage 1: Postgraduate Certificate in BIM Technologies

Stage 2: Postgraduate Diploma in Collaborative BIM

Stage 3: MSc in Applied Building Information Modelling & Management

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The MSc in Applied BIMM is a Level 9 Part-time programme delivered over a two and a half year period.

Stage 1: Is mainly about gaining competence in discipline specific BIM technologies and a first look at the theory of BIM. The final 'Federated' module of Stage 1 brings all disciplines together to collaborate for the first time in teams on a small project with a first introduction to BIM 360 cloud collaboration.

Stage 2: Is very much about bringing the skills and competencies from Stage 1 forward to work collaboratively in teams over two linked modules. Stage 2 also offers students an elective module of their choice in areas such as Lean, Dynamo, AR/VR, BIM for Clients & FM.

Stage 3: Takes all of the learning from the previous two years and expand on this knowledge through research to produce a final Capstone paper set at journal article standard.

Stage 2: 30 ECTS: Postgraduate Diploma in Collaborative BIM

Elective (Lean, Dynamo, AR/VR, BIM for Clients & FM – 5 ECTS)

Collaborative BIM Process – 10 ECTS
Transition to ISO 19650 Standards - 2019

Multidisciplinary Collaboration Project (MCP) – 15 ECTS

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This is an overview of Stage 2 where you will see the elective modules and then the Collaborative BIM Process module where students take a really deep dive into the entire BIM process, including all of the associated documentation and standards.

This links into the Multidisciplinary Collaboration Project or MCP module, that this paper reports on. Here students work in teams to produce a building project to tender stage with various requirements throughout the module.

Stage 2: MCP Project 2019 – Broombridge Design & Construct Centre

Site Visit Data Collection:

- Photographic Data
- Digital Dimensional Data
- Visual Infrastructural / Community Information
- Drone Survey – Provided by Student Participant
- Point Cloud & Photogrammetry Survey

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Last year's MCP project focused on TU Dublin's newly acquired facility in Broombridge, Dublin. This is now being developed into a major Design & Construct Centre. This development will have strong links to industry and a 'supporting partner' in Autodesk. As this was an existing structure, at the start of the module, students carried out site surveys that included Photographic Data, Digital Dimensional Data, Visual Infrastructural & Community Information, Drone Survey, Point-Cloud and Photogrammetry Surveys.

MCP Project Outline Brief 2020:

- Multidisciplinary Design Project up to Tender Stage of; Three New TU Dublin Proposed Student Accommodation Blocks
- To include:
    A. **Requirements under the Strategic Development Zone (SDZ) designation.**
    B. **Adherence to the Grangegorman Development Agency (GDA) Master & Strategic Plans**
    C. **Integration with Campus Site Services Infrastructure (CHP etc.)**

- The focus of this project was on Collaborative Design & Not an Architectural Design Competition.
- MCP Projects brought from Concept Design to Tender Stage
- Six Multidisciplinary Teams - each comprising Four Participants
- TU Dublin Client Requirements outlined within a detailed package including, EIR, Project Brief, Project Specification & Data-Drop Schedule

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This year's MCP Project was based within the new TU Dublin Campus in Grangegorman, Dublin. This year's project was the Design, up to Tender stage, of three new Student Accommodation Blocks situated on the campus grounds. Some of the main project requirements with this Strategic Development Zone were compliance with, the Grangegorman Development Agency or GDA Master Plan and also Integration with the proposed campus site services – for example the Combined Heat & Power plant.

Students are advised at the start of these projects that this is NOT an architectural design competition but a multidisciplinary collaborative project brought from concept to tender stage.

We had six teams participating in this year's project, and at the very beginning they were issued with a very detailed and project specific; Exchange Information Requirements or EIR, a Project Brief, a Specification along with Data-drop & Project Information Requirements (Old PLQ's). Also, at this early point, a complete CDE and Cloud collaboration environment is also set up for each team using BIM 360. So my colleague Emma Hayes & I are extremely busy in advance of the start of this module.

This is a concept overview of the three student accommodation blocks within the new TU Dublin Campus used for this project – each block was given for design to two teams. This also allowed us to draw some comparisons in both design and standards used.

Multidisciplinary Collaboration Project (MCP) 2020

TU Dublin: Grangegorman Development
Campus & Student Accommodation Blocks
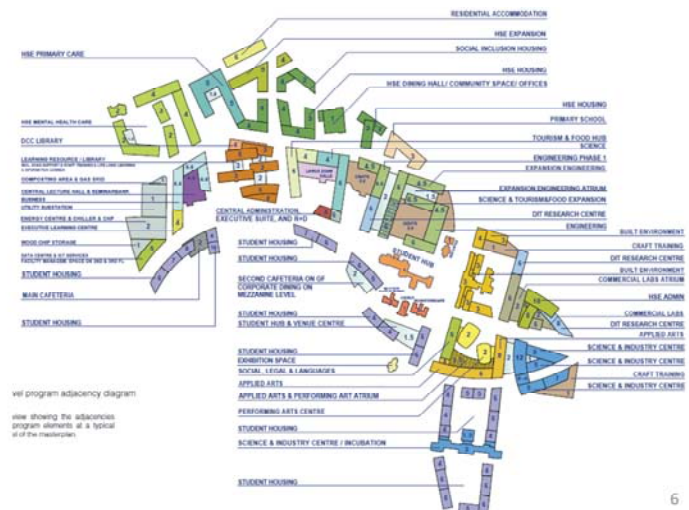
This is an example of some of the overall campus information that was available to each team from the GDA Masterplan.

Multidisciplinary Collaboration Project (MCP) 2020

TU Dublin: Grangegorman Development
Campus Site Services Infrastructure

stack driven ventilation
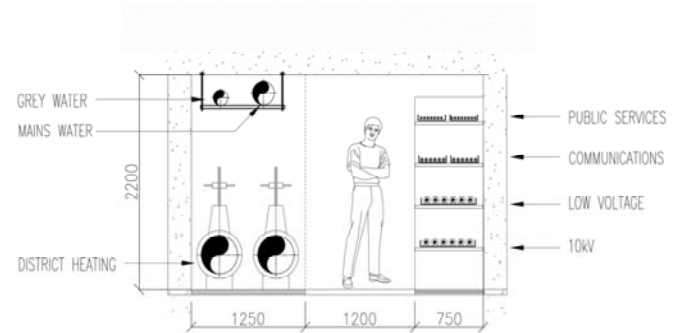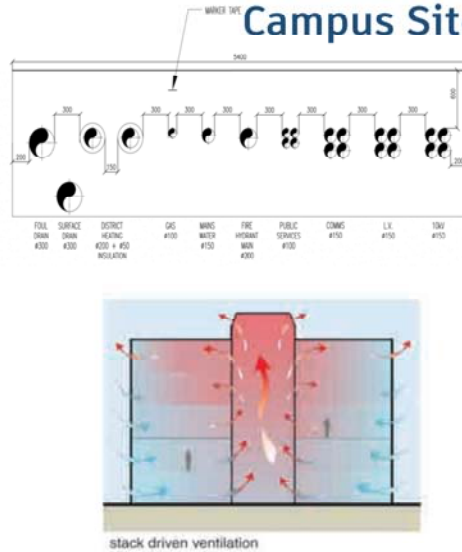
NB: GAS MAINS IN SEPARATE INDEPENDENT TRENCH

This is also a small example of the campus site services and infrastructural information that was available to each team, again from the GDA Masterplan

Multidisciplinary Collaboration Project (MCP) 2020

TU Dublin: Grangegorman Development
Staff Support & Discipline Specific Advisory Team

DT 9876 MCP 2020: Client Project Team	
Module & Project Lead / Client	Discipline
Kevin Furlong	BIM Process / MEP / Energy Analysis
Emma Hayes	BIM Process / Arch Tech
Client Professional Advisors	
Kirk McCormack	Architectural / Arch Tech
Mairtin Dalton	Architectural
Barry McAuley	Construction Management / QS
Ruairi Hayden	Construction Management
Avril Behan	Geomatics Surveying
Una Beagon	Structural Engineering
Dermot Kehily	Quantity Surveying
Kieran O'Neill	Lean Construction

As part of the authenticity of the module, we also have discipline specific professionals from within the college, who were invited to participate in an advisory capacity to assist both the module leaders and students to ensure particular standards were being met.

Stage 2: MCP – TU Dublin Client Package
Documentation & Resources

Project Specific Detailed EIR: Project Specific Detailed Brief: Project Specific GDA Masterplan:
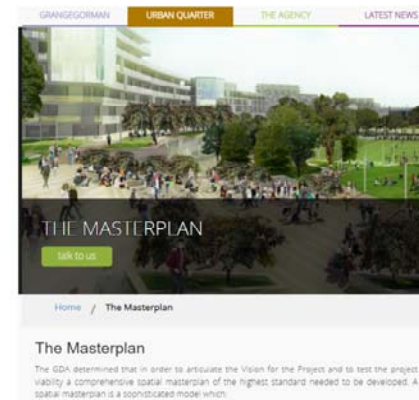
This shows the main document set, referred to earlier, issued at the start of the module, from the left is the EIR, Project Brief, and the GDA Masterplan as it applied to this semesters project.

Client Documentation:

Project Specific Data-Drop / Approval Gate Schedule (NBS & RIBA PoW Derived)

	Tuesdays	Thursdays	Semester Week	CMIS Week	Module Stages	RIBA PoW Stages - Project Specific	Data Drops	Requirements	PIR's
January	2020/01/21	2020/01/23	0	22	0			Research Skills	
	2020/01/28	2020/01/30	1	23	1	0 Strategic Definition	0	Development of Websites & Collaboration	1 - 2
	2020/02/04	2020/02/06	2	24	2	1 Preparation & Brief	1	Pre-Contract BEP	
February	2020/02/11	2020/02/13	3	25	3	1 Preparation & Brief	2	Post-Contract BEP (PIP) (CDE Set-up)	
	2020/02/18	2020/02/20	4	26	4	1 Preparation & Brief	3	MIDP, TIDP, CIC Protocol & Procurement	3 - 13
	2020/02/25	2020/02/27	5	27	5	2 Concept Design		Research Skills	
	2020/03/03	2020/03/05	6	28	6	2 Concept Design			
March	2020/03/10	2020/03/12	7	29	7	2 Concept Design	4	Outline Model Proposals & Energy Analysis	14 - 21
	2020/03/17	2020/03/19	8	30	8	3 Developed Design			
	2020/03/24	2020/03/26	9	31	9	3 Developed Design		Developed Model Design with Cobie Outputs	
	2020/03/31	2020/04/02	10	32	10	4 Technical Design (TD)	5 & 6	Developed Mech, Elec, Energy Analysis, Renewables	22 - 28
April	2020/04/07	2020/04/09	Easter	33	11	4A TD Pre-Construction			
	2020/04/14	2020/04/16	Easter	34	12	4A TD Pre-Construction	7	Final Model Design and PIM	29 - 33
	2020/04/21	2020/04/23	11	35	13	4B TD Final Tender		Final Tender Package & Federated Model	
	2020/04/28	2020/04/30	12	36	14	4B TD Final Tender	8	Final Tender Package & Federated Model	34 - 35
May	2020/05/05	2020/05/07	13	37	15	Final Presentations	9	Final Presentations: Date TBC	
	2020/05/12	2020/05/14	14	38		Final Submissions		Research Skills	
	2020/05/19	2020/05/21	15	39				Research Skills	
	2020/05/26	2020/05/28	16	40		Final RW Submission			2020/05/28

Within the above Project Brief is this detailed project structure that is adapted from the RIBA Plan of Work stages to fit within the academic year. There are specific colour coded, project stages, run over the academic term, with Data-drop requirements associated with each stage. These data-drops form part of the continuous assessment for the module. Further on the right are the associated Project Information Requirements (or PLQs in old terms). These are also listed per design stage. With this detailed documentation student teams can see from the very first day the entire structure of the module and every submission requirement and deadline.

Client Documentation:

Project Specific Data-Drop / Approval Gate Schedule (NBS & RIBA PoW Derived) & PIR's

	Client Project Information Requirements					
Stage	Stage Description	Data Drop	Data Drop Purpose		PIR	Action by
0	Strategic Definition		Draft EIR	1	What is the information management Strategy for the project	Client
0	Strategic Definition		Pre Contract Survey	2	What are the characteristics of the site for the current phase of development	Geo Surveyor

The numbered Project Information Requirements listed on the previous schedule are also fully outlined within the EIR and match the colour coding of the applicable project stages.

Client Documentation:

Project Specific Data-Drop / Approval Gate Schedule (NBS & RIBA PoW Derived) & PIR's

1	Preparation & Brief	1	Pre Contract BEP	3	Have the purposes for which the model will be used been defined	Client
1	Preparation & Brief	1	Pre Contract BEP	4	How will BIM be managed and exploited in this project	Design Team
1	Preparation & Brief	1	Pre Contract BEP	5	What is the available site	Geo Surveyor
1	Preparation & Brief	1	Pre Contract BEP	6	What physical constraints are there on and around the site	Design Team
1	Preparation & Brief	1	Pre Contract BEP	7	What services constraints (water, drainage, electricity, etc.) exist	Design Team
1	Preparation & Brief	1	Pre Contract BEP	8	What other data about the site or asset is available from client records	Client
1	Preparation & Brief	1	Pre Contract BEP	9	What will be the generic services philosophy	Client
1	Preparation & Brief	2	Post Contract BEP, PIP	10	What information do facilities managers need	Design Team
1	Preparation & Brief	3	MIDP, TIDP, CIC Protocol & Procurement	11	What is the proposed procurement route and recommendations	Design Team
1	Preparation & Brief	3	MIDP, TIDP, CIC Protocol & Procurement	12	Is there a means of controlling distribution of documents	Design Team
1	Preparation & Brief	3	MIDP, TIDP, CIC Protocol & Procurement	13	How will the client be consulted with respect to detailed changes to designs & brief	Design Team

2	Concept Design	4	Outline Model Proposals & Energy Analysis.	14	How would the outline development look [early stage visualisation]	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	15	What is the outline proposal for space design	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	16	What are the zoning designs for services systems	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	17	Can Building Regulations Part L and EPC requirements be met	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	18	Has the concept been designed for Lean manufacture, construction and assembly	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	19	Has the concept been designed for Green manufacture, construction and assembly	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	20	Have any client specific space requirements been met	Design Team
2	Concept Design	4	Outline Model Proposals & Energy Analysis.	21	Are there any deviations from the brief or proposals to improve it	Design Team

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The numbered Project Information Requirements listed on the previous schedule are also fully outlined within the EIR and match the colour coding of the applicable project stages.

Stage 2: MCP Twice Weekly Face to Face Collaboration – Pre Covid 19

Big BIM Room

Pre-Covid 19 this was our MCP room – 'our Big BIM Room' where twice weekly face-to-face team collaboration and module leader meetings and monitoring was carried out.

Stage 2: MCP Twice Weekly Meetings Move to Online Collaboration

- **University closed Thursday March 12th @ 16.00pm – class fully up and running online for 18.00pm.**

- Structured Module with pre-defined deliverables, dates, requirements & resources allowed for this easy transition.

- Cloud Collaboration achieved using BIM 360 & College Virtual Learning Environment (VLE) Brightspace 'Virtual Classroom'.

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At approximately 4.00pm on Thursday March 12th, through Government guidelines we got notice from our College administration that the University was to close that evening. We had a class scheduled later that evening so we moved quickly to set up virtual meetings with each design team using our University VLE, 'Brightspace.' We then carried on collaboration on the cloud that evening through BIM 360. We believe it was the front loading of all of the project resources and deliverables and the fact that we had set up, and had been using, BIM 360 for the first 6 weeks, that made this transition so seamless.
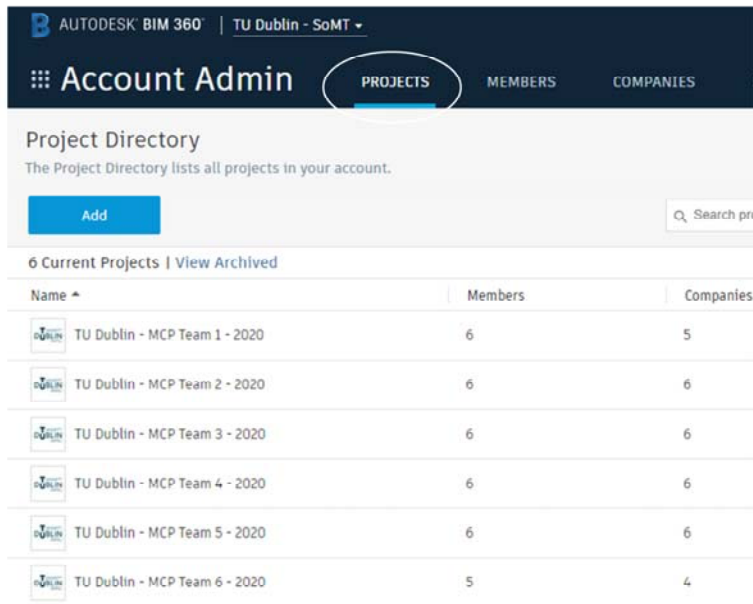
Client Resources – Autodesk BIM 360 Design
Main Set Up before Start of Module – Final Set-up after First Team Meetings

We have found that for our needs that there are two levels of BIM 360 Set-up. First is the setting up of all of the student team projects as an administrator. It should be noted that this takes some considerable time at the start but done properly affords extremely smooth running of the project thereafter. Second stage of setting up is after initial team meetings where we discuss fully with each group their recommendations on the most suitable procurement route they see fit for their project and subsequently their desired team workflow. This is an extremely important step because with the intelligent use of permissions, roles, companies & teams at the early stage, BIM 360 can be set up to match any procurement methodology and workflow.

Stage 2: MCP CDE – BIM 360 Design – Set-Up – *Projects & Companies*

Shown here is the initial setting up of the main projects. Here you can see we have set up a separate project for each of the six multidisciplinary student teams. We also set up a full list of discipline specific companies with the option of having a company for each individual student, depending on their desired team workflow. This level of organisation at the start pays dividends later throughout the project where workflows can be easily controlled.

Having created the projects, we then add members to each project, and then really importantly assigned a specific Role, Company & Services or Entitlements to each member. You can see here what services have been made available to each member and they are also summarised on the right.

This is where a lot of thought needs to be applied to a teams proposed workflow and their chosen procurement methodology. They need to be assigned the correct Role and be assigned to the correct company. We would also advise that this level of organisation be applied to real projects.
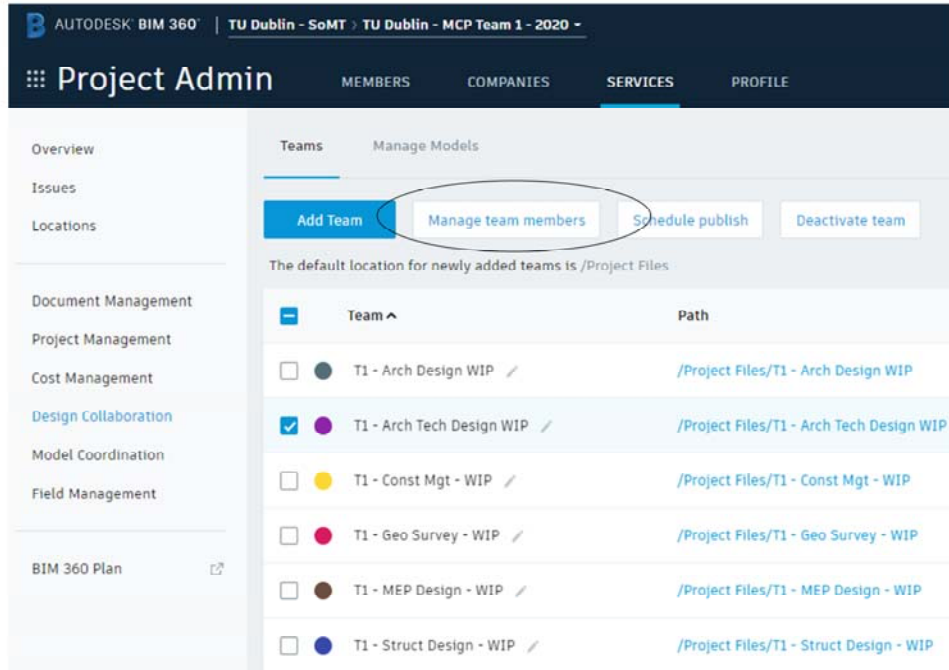
The Procurement Methodology or contract type is simply listed here on the project admin page, but it is through the structured organisation of participants, previously described that really drives the process.

Stage 2: MCP CDE – BIM 360 Design – Set-Up - *Teams*

To finally create the desired collaborative workflow, again on the admin page, is where the all-important Project Teams are first created. This again needs to be done extremely deliberately to achieve the preferred results. As shown here, the members of each team can now be managed.

When 'Manage Team Members' is selected and again with forethought on procurement and team workflows, members, roles or companies are now added to each team and assigned a level of permission. This is a really good example of the added control we now have on the overall project, having taken the time to assign roles and companies earlier. For example, we could add a company here that is already populated with many members or add many members with a specific role.

Stage 2: MCP CDE – BIM 360 Design – Set-Up - *Workflow*
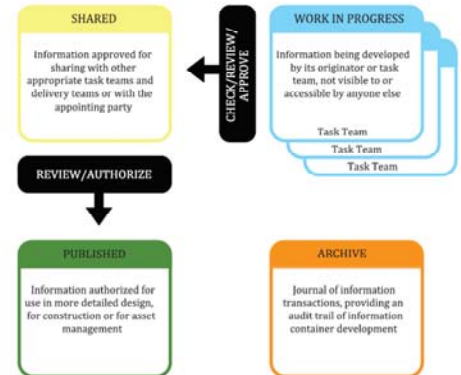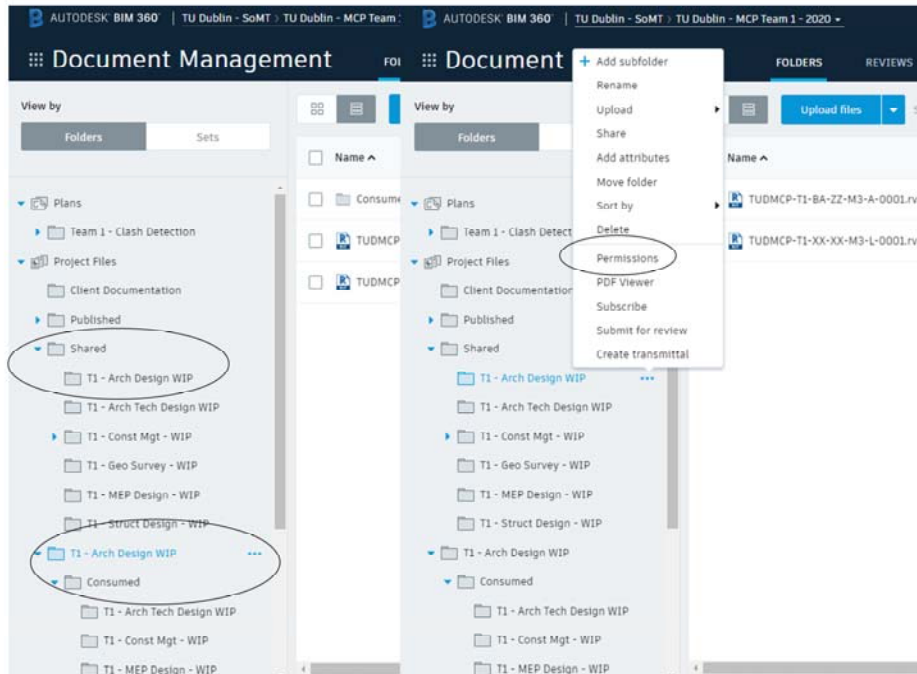
The strategic setting up of the teams then automatically creates the procurement appropriate WIP, Shared & Consumed folders that can match ISO 19650 requirements. Further permissions can also be added to these individual folders to allow even more complex workflows.

Stage 2: MCP CDE – BIM 360 Design – Set-Up - *Collaboration*
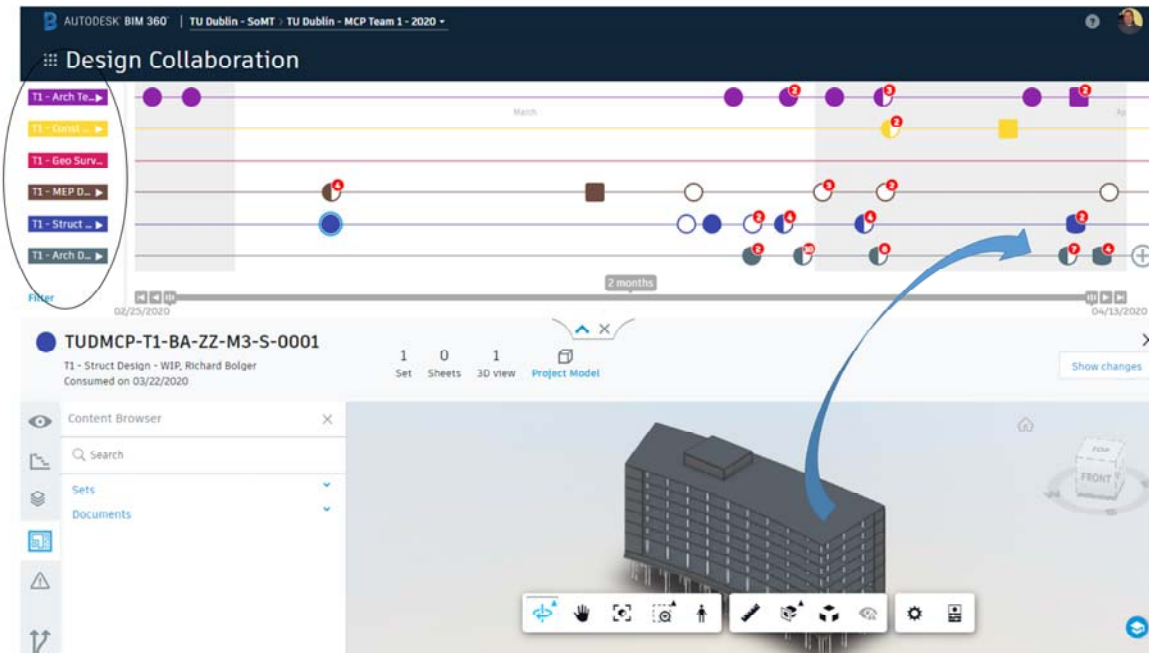
The creation of each team also populates the timelines for 'design collaboration' that allows for the sharing and consuming of model data. From a continuous assessment perspective, this also provides an excellent view of each individual's participation, team collaboration, level of development & engagement.

Each Team's use of BIM 360 for collaboration also includes the use of RFI's. We have found these also to be an excellent educational tool, for capturing and monitoring, the level of team and individual collaboration, and their efficiency in response times.
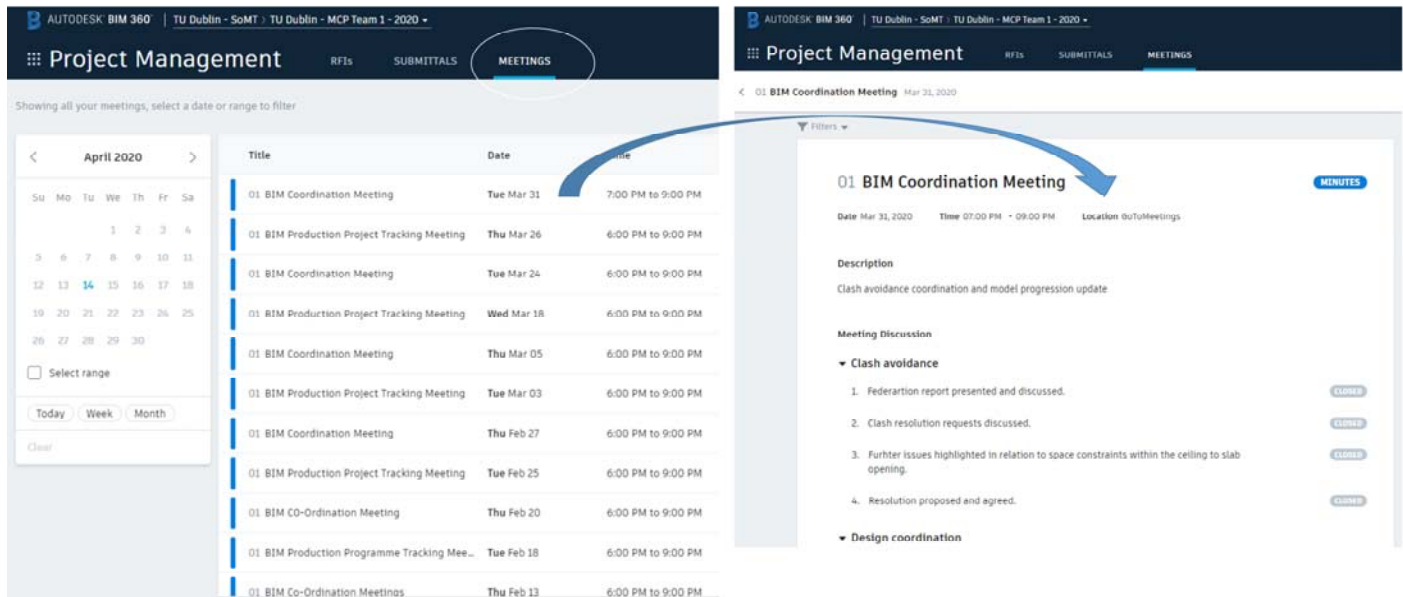
We also receive email notification of RFI activity.

Stage 2: MCP CDE – BIM 360 Design – Set-Up - *Meetings*

Many of the design team have also found the use of the Meetings tool within BIM 360 for further collaboration and planning extremely useful. This again we have found to be a really good educational tool for capturing and monitoring the level of team and individual collaboration. As can be seen on the right minutes for each meeting are captured.

Stage 2: MCP CDE – BIM 360 Design – Set-Up - *Issues*

Each Teams use of the software also includes the use of Issues. As with the RFIs, this we have found again to be a really useful educational tool for capturing data.

Collectively, all of the above tools have greatly decreased the possibility of disputes within teams, as all of the above data is immediately available, has a distinct trail that's set against time and its fully transparent.

Stage 2: MCP CDE – BIM 360 Design – Set-Up – *Review & Feedback*

Document Management   FOLDERS   **REVIEWS**   TRANSMITTALS   ISSUES

Filter ▾
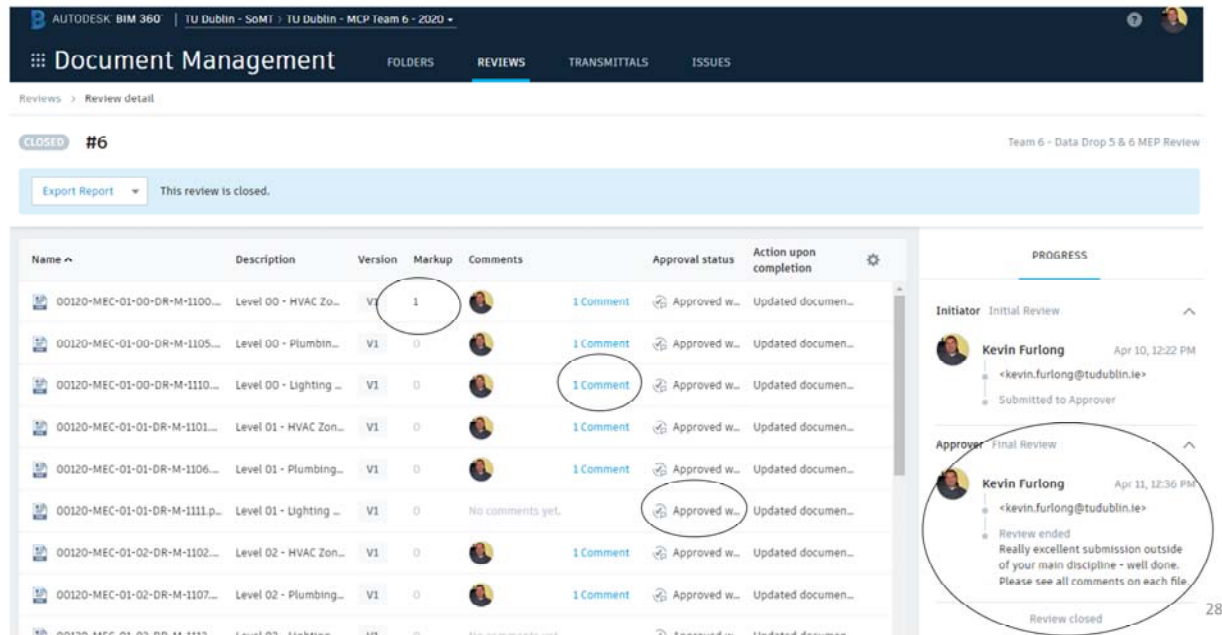
Status	ID	Review name	Workflow	Initiated by	Next action by	Next action due	Documents	Approved	Rejected
CLOSED	10	Team 6 - COBie Spreadsheet - Data-Dr...	Data Drop Single Stage Workflow	Kevin Furlong	--	--	1	1	0
CLOSED	9	Team 6 - Data Drop 5 & 6 Federated R...	Data Drop Single Stage Workflow	Kevin Furlong	--	--	4	4	0
CLOSED	8	Team 6 - Data Drop 5 & 6 Architectural...	Data Drop Single Stage Workflow	Kevin Furlong	--	--	1	1	0
CLOSED	7	Team 6 - Data Drop 5 & 6 Structural R...	Data Drop Single Stage Workflow	Kevin Furlong	--	--	4	4	0
CLOSED	6	Team 6 - Data Drop 5 & 6 MEP Review	Data Drop Single Stage Workflow	Kevin Furlong	--	--	20	20	0
CLOSED	5	Team 6 - Data Drop 5 & 6 Architectural...	Data Drop Single Stage Workflow	Kevin Furlong	--	--	13	13	0
CLOSED	4	Data Drop Single Stage Workflow	Data Drop Single Stage Workflow	Emma Hayes	--	--	4	4	0
CLOSED	3	Data Drop Single Stage Workflow	Data Drop Single Stage Workflow	Emma Hayes	--	--	5	4	1
CLOSED	2	Data Drop Single Stage Workflow	Data Drop Single Stage Workflow	Emma Hayes	--	--	11	11	0
CLOSED	1	Data Drop Single Stage Workflow	Data Drop Single Stage Workflow	Emma Hayes	--	--	6	6	0

Full Review Workflow Set Up for Every Document within Every Data-Drop – With Approval Status & Full Feedback (approx 50 Files, Models & Sheets per data-Drop per Team) (Approximately 300 Files per Data-drop for Approval / Feedback. Total circa 2,700 Files

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Pushing the use of BIM 360 further for educational purposes, when each Team submits a design stage data-drop we then submit each set of documents through the BIM 360 Review process. We have found this a really powerful method of providing immediate feedback on this continually assessed module, and essential to the success of this type of project-based-learning.

Using this type of assessment for learning however, needs a lot of time to be invested. Each of the data-drops typically include around 50 files, consisting of models & documents. This is by six teams, meaning feedback is required on approximately 300 files per data-drop adding up to the review of approximately 2,700 files & models over the 9 module submissions.

The above feedback to students is provided on around five or more levels, firstly there are; mark-ups & comments on each file or model, then every file is assigned a status of (approved, approved with comments, or rejected) (other, terms can be formatted) and then also overall comments are applied to the entire data-drop. This process then automatically generates a review report, in Excel, that we export and send to each team. This is proving to be an excellent educational resource for continuous assessment, feedback, grading, and the capturing of all data in one single location.

Stage 2: MCP CDE – BIM 360 Design – Set-Up – *Review & Feedback - Reports*

A further level of feedback is then provided with twice weekly (which are now virtual) meetings where we engage through Brightspace and BIM 360 to discuss data-drop reviews and project progress and support. We don't believe in the history of constructive feedback that any group ever got so much.

Stage 2: MCP CDE – BIM 360 Design – Set-Up – *Collaboration Tracking & Data*

School of
Multidisciplinary
Technologies
Engineering and the
Built Environment

Design Packages

Package Title	Created By	Date
○ TUDMCP-T1-BA-ZZ-M3-E-0001		Yesterday
○ TUDMCP-T1-BA-ZZ-M3-A-0001		Yesterday
○ TUDMCP-T1-XX-XX-M3-L-0001		Yesterday
● TUDMCP-T1-BA-ZZ-M3-S-0001		Apr 12, 2020
● TUDMCP-T1-BA-ZZ-M3-A-0002		Apr 12, 2020
○ TUDMCP-T1-BA-ZZ-M3-A-0001		Apr 11, 2020

6 of 66 Packages | View all (66)

Open RFIs and Submittals

● Overdue   ● Due in the next 5 days   ● Due after 5 days

2 RFIs		
1	1	

0 Submittal Items
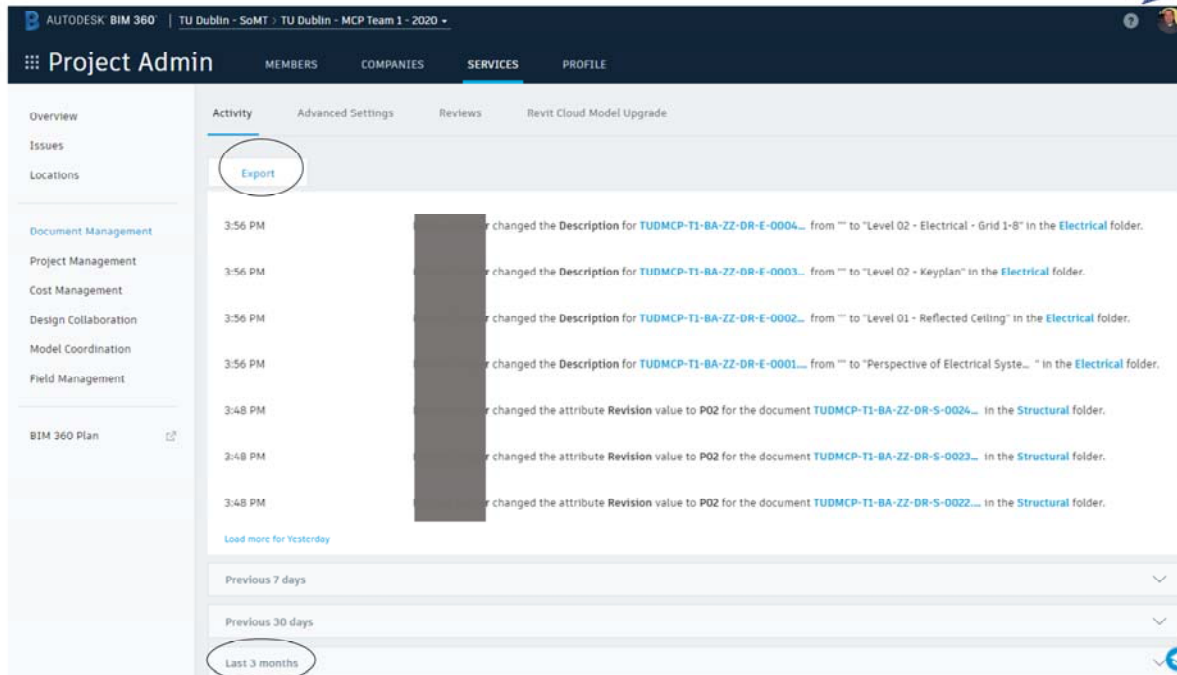
Project RFIs

ID	Title	Due Date
12	No Door to apartment on Level 02 and above	Yesterday
11	Architectural Layout Level 02 & Level 03	

RFI Activity

● RFIs

NOVEMBER   DECEMBER   JANUARY   FEBRUARY   MARCH   APRIL

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As shown here, further team information, tracking and review of team progress, and collaboration is also available through the project home page on analytic panels.

If required also, there is an extremely detailed, up to the minute, review and record of **all** activity (even documents someone has only viewed) over the entire module. This is provided through the project admin 'Activity' tab. In the past we have found this very useful to resolve team and peer assessment disputes. There is an amazing level of data here with every level and type of engagement captured. We believe some really useful BIM research could be carried out using this type of data.

A point to note here also is that all of the workflows we have discussed so far are all being done from home. Also each student team are collaborating & designing remotely from each other through BIM 360. They are using Autodesk Revit cloud models for Live Linking, Sharing, Consuming, Coordinating and Federating. (All from different locations).

Projects brought from Design to Tender Stage
Module Team Deliverables:

- Development of Project Team CDE to Record Collaboration & Design

- Project Decision Stages & Data Drop Requirements

- Project Information Requirements Response's

- Development & Use of CDE using Autodesk BIM 360

- Final Design, Tender Package & Presentations

- Final CDE Development to Appropriate Standards

- Individual Reflective Writing Paper (30% of Module Grade)

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Having been issued with all of that up front material the main Deliverables from each Design Team are

Development of each Project Teams BIM 360 CDE to Record Collaboration & Design

- The Continually assessed - Project Design Stages & Data Drop-Requirement Submissions (of which there were 9 in total this semester)

- Responses to the stage specific Project Information Requirements (or PLQs in old terms)

- Development & Use of their BIM 360 CDE to appropriate standards, to show increasing levels of design development and information (or level of information need as its now known)

- Final Design, Tender Package along with Team Presentations (which will be online this year)

- Individual Reflective Writing Paper that accounts for (30% of Module Grade)

As can be seen this is a really full on industry matched module that has produced some really innovative work.

Autodesk BIM 360 Design – Findings & Lessons

- BIM 360 - has proved to be a complete game changer on the module – (Pre & Post Covid 19) – with the entire module data fully captured and recorded within a single source.

- With a structured and deliberate approach, a proper low-trust WIP environment can be set up that affords compliance with the new standards – (ISO 19650)

- As shown earlier it can be set-up to match any procurement methodology with clever permissions and team formations assigned

- Allowed for excellent cloud collaboration and work-sharing throughout the module – with seamless Revit Integration and it now also accepts MS Office files

- As shown previously there is excellent Document and Collaboration tracking with full activity analytics that could inform further research

- Educationally we adapted the software to provide immediate reviews and feedback with appointed status and reports on all published files & models.

- Very positive feedback from participants (especially since covid 19 allowing the module to continue uninterrupted)

- We are still carrying out further research on the analytics of the entire module as many other benefits appeared to emerge through the design stages

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Some final thoughts and lessons learned from our use of BIM 360 are;
- Since we introduced BIM 360 into the programme – it has proved to be a complete game changer – (Pre & Post Covid 19) – with the entire module data fully captured and recorded within a single source.
- With a structured and deliberate approach, a proper low-trust WIP environment can be set up that affords compliance with the new standards – (ISO 19650)
- As shown earlier it can be set-up to match any procurement methodology with clever permissions and team formations assigned
- Allowed for excellent cloud collaboration and work-sharing throughout the module – with seamless Revit Integration and it now also accepts MS Office files
- As shown previously there is excellent Document and Collaboration tracking with full activity analytics that could inform further research
- Educationally we have adapted the software to provide immediate reviews and feedback with appointed status and reports on all published files & models.
- Very positive feedback from participants (especially since covid 19 allowing the module to continue uninterrupted)
- We are still carrying out further research on the analytics of the entire module as many other benefits appeared to emerge through the design stages

Concept Stage Examples:

Finally, this module has transitioned extremely easily from a classroom and blended approach to a fully online setting. We believe this is because of the front-loaded and structured nature of the module along with the cloud collaboration and design platform BIM 360. The fact that we had already adapted many of the Tools within the platform for educational use made this transition even easier.

Detailed Design & Tender Stage Examples:

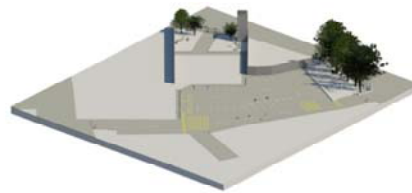Architectural Information Model

Structural Information Model

MEP Information Model

Civil Information Model

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There is a huge amount of preparatory work to be done before this module starts, but the benefits of creating a student-centred & collaborative project-based learning environment that we believe fully promotes deep learning is very much worth it.

Last semesters Broombridge Design & Construct Centre project, produced some outstanding work, this render is just an example.

Detailed Design & Tender Stage Examples:

| Ireland's Top 10 Construction & Engineering companies employ our graduates | 8,000m² of flexible space for a unique education, research, and recreation facility | Up to 8,000 students taking part in collaborative educational activities each year | Supported by leading international and national AEC leaders as well as Enterprise Ireland | €22 Million investment for one-of-a-kind centre in Ireland |

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We are also trialling at the moment a screen recording software called 'Camtasia', this will really help in the future for creating online or blended video content that we can used to teach the likes of BIM 360 or Revit.