

Coffey Group

BIM for Water:

Filtration, Automation & Fabrication

Andy McNamara
BIM Manager

Introduction



- Established in 1974.
- Family owned business.
- Group Head Office in Athenry, Galway.
- UK Offices in St. Helens, Bathgate and Peterborough
- Sectors – Rail, Bridge, Roads, Pipelines, Water & Wastewater treatment plants, Power infrastructure, Buildings, flood Defence, General infrastructure.

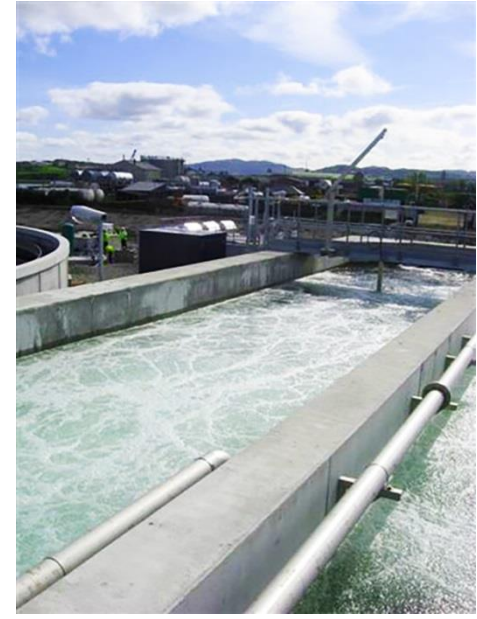
Water & Wastewater

Engineering Tomorrow's Infrastructure



Water & Wastewater

Engineering Tomorrow's Infrastructure



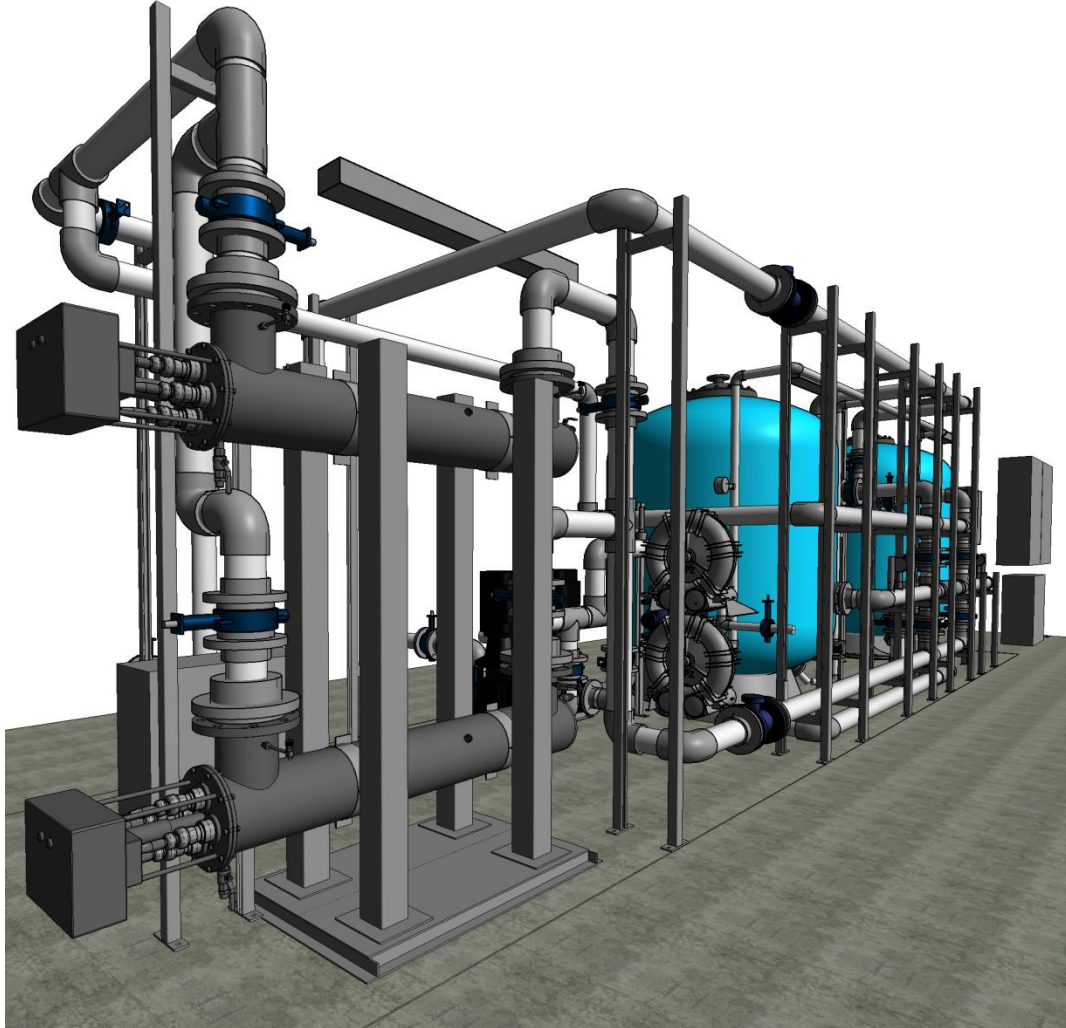
Clients

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Introduction

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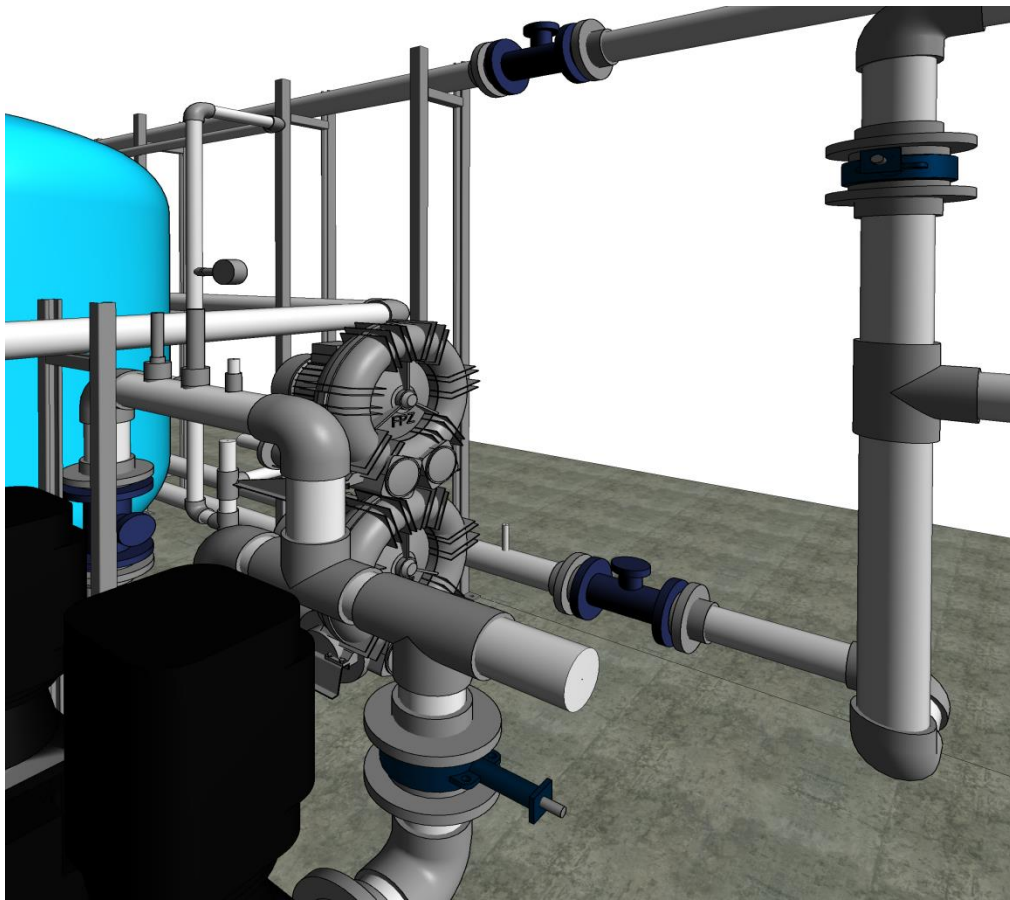
- Coffey Group BIM Journey
- BIM Pilot Project
- Automation
- Fabrication
- Virtual Reality
- Augmented Reality

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BIM for Water:

Filtration, Automation & Fabrication

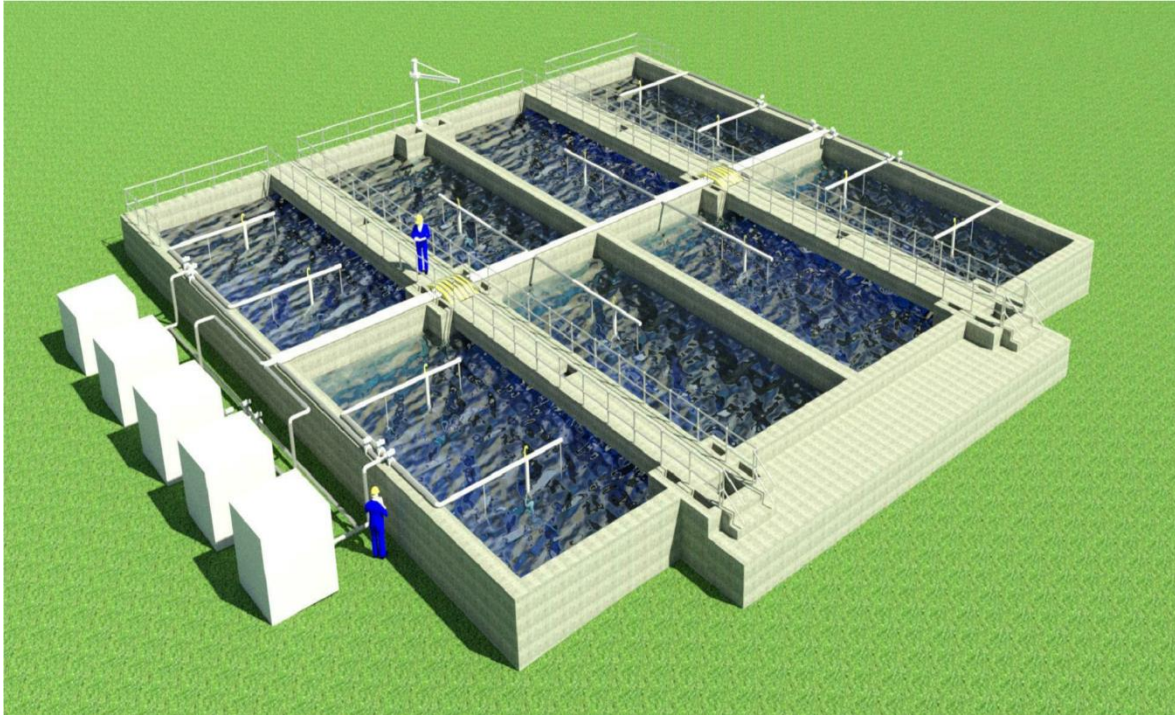
BIM Pilot Project



- Generating new business
- Meeting client requirements
- Streamlining design activities
- Improving design quality
- Further integrating H&S into the design process
- Improving communication
- Cost monitoring and savings

BIM - Drivers

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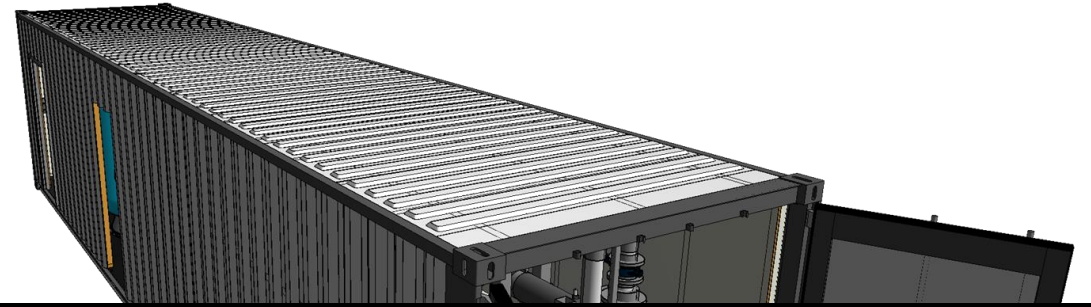


- Time savings
- Accurate construction sequencing
- Clash detection / avoidance
- Increased pre-fabrication
- Aiding FM and O&M processes
- Automation of schedules
- Innovation

- Client – Irish Water

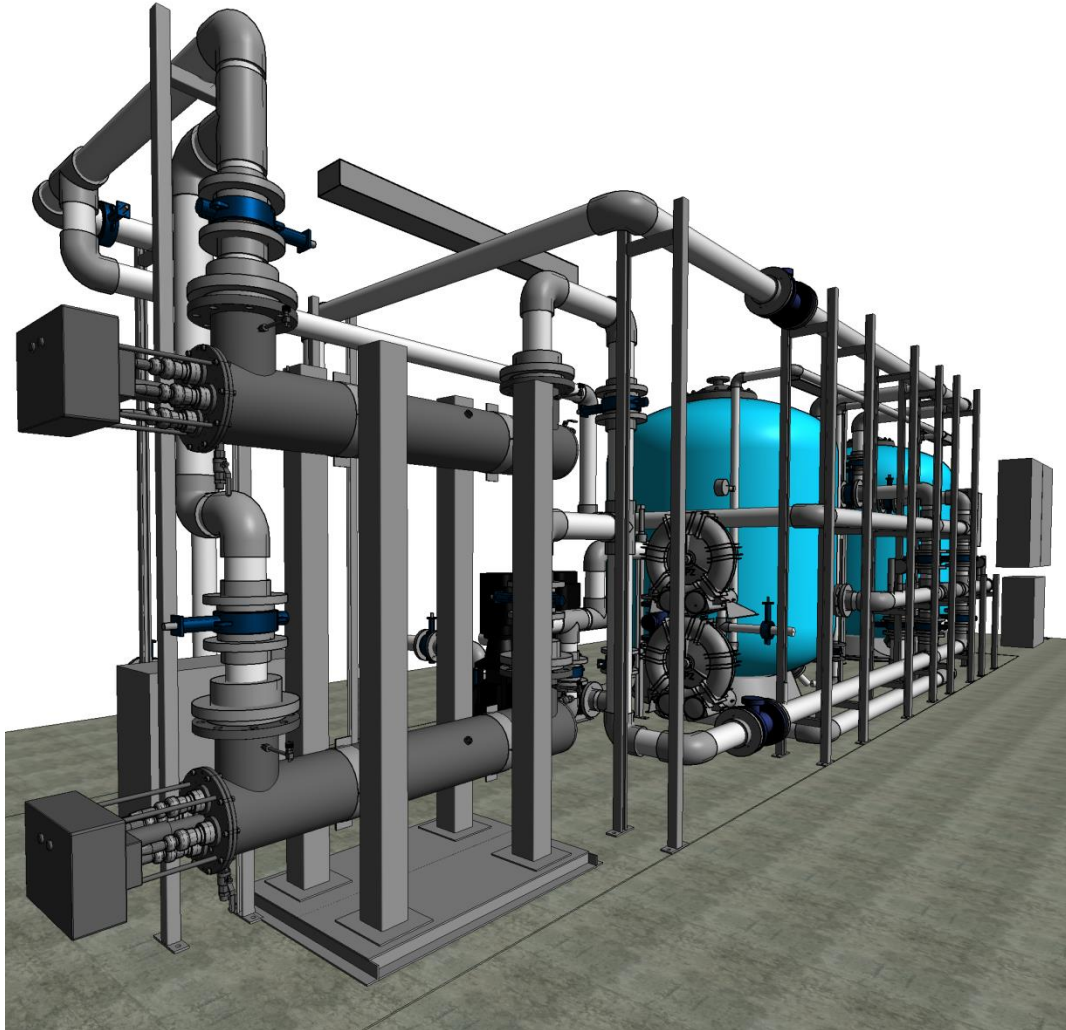


- Self-contained, portable WTP



Pilot Project 1 – Success Criteria

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- Deliver the project in accordance to the relevant standards
- Deliver all construction documentation via Autodesk Revit
- Develop 4D (time) and 5D (cost / quantity) models
- Handover the Asset Information Model to Irish Water on completion
- Develop a BIM Library
- Automation
- Optimise pipe cutting for minimum waste

Linking to IW's IBM Maximo

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Irish Water Form IW-AMT-FM-021		Revision: v. 4.3		PM	
Planned Maintenance and Asset Register Templat				<button>CLEAR ASSETS</button>	
Plant Name:-	CLONES - WATER TREATMENT PLANT CARNROE WTP				
Location:-	L125247	Location Tag:-	MN-L125247-DWTP		
Site Type:-	WATER TREATMENT PLANT				
LA Name:-	Monaghan County				
EPA Code:-	SZPUB0451				
P&ID Number:-					
Item Number	Site Type	Level 6 Process Stage	Level 7 Sub-Process Stage		
1	WATER TREATMENT PLANT	Raw Water	Transfer		
2	WATER TREATMENT PLANT	Raw Water	Transfer		
3	WATER TREATMENT PLANT	Raw Water	Transfer		
4	WATER TREATMENT PLANT	Raw Water	Transfer		
5	WATER TREATMENT PLANT	Treated Water	Transfer		
6	WATER TREATMENT PLANT	Settled Water	Clarification		
7	WATER TREATMENT PLANT	Settled Water	Clarification		
8	WATER TREATMENT PLANT	Filtered Water	Flow Measurement or Monitoring or Ctrl		
9	WATER TREATMENT PLANT	Filtered Water	Flow Measurement or Monitoring or Ctrl		

- Early tests linking to Irish Water's IBM Maximo system have been successful
- CWL is the first company to achieve this
- Automatically populates Irish Water's Asset Register
- Improves accuracy and removes human error
- Saves time without lost of quality



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Automation



There are three parts to a Dynamo node:

Name - The Name of the Node with a tool.

Category - Name naming convention.

Ports - The inputs and outputs that supply

the input data to the Node as well as the

results of the Node's action.

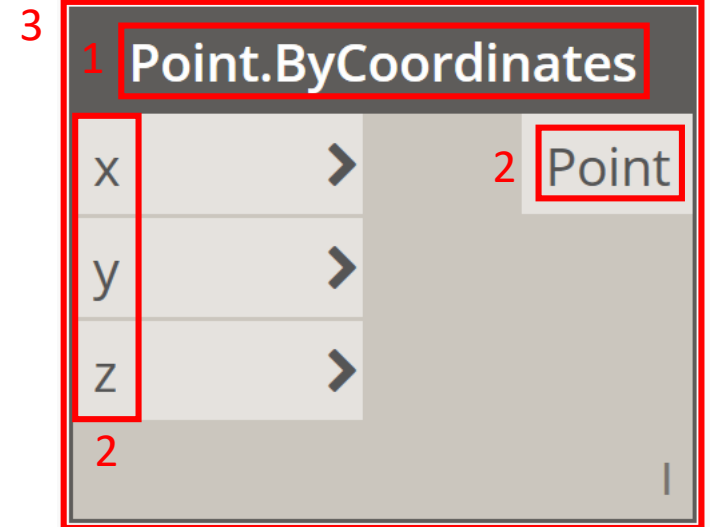
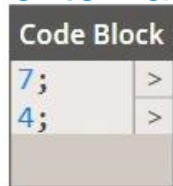
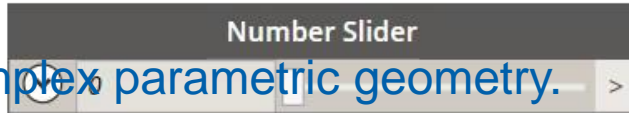
Main - The main body of the Node.



Dynamo can:

Create and modify complex parametric geometry.

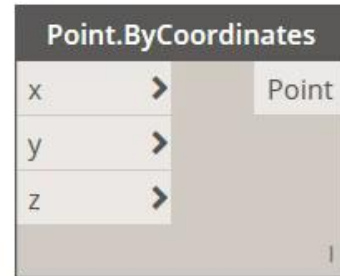
Read and write to and from external databases.



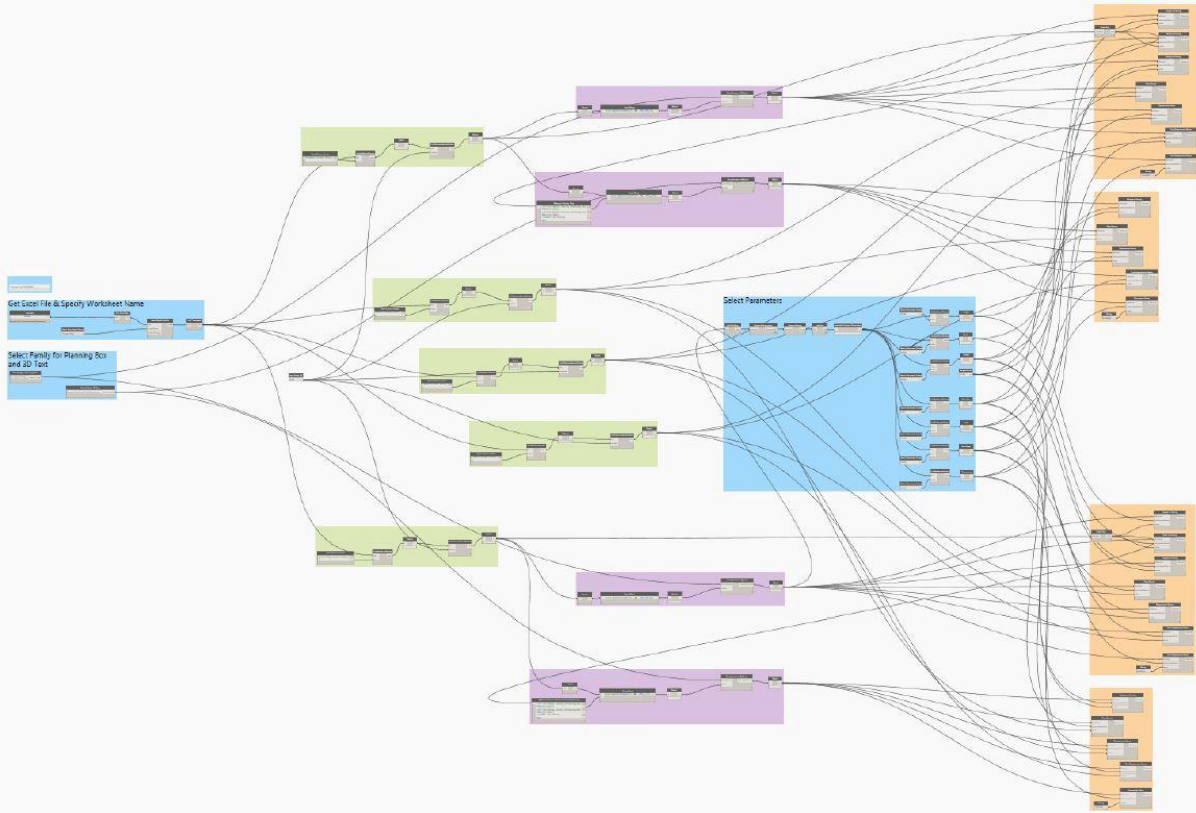
The "Points.ByCoordinates" node



Results



~~Dynamo~~

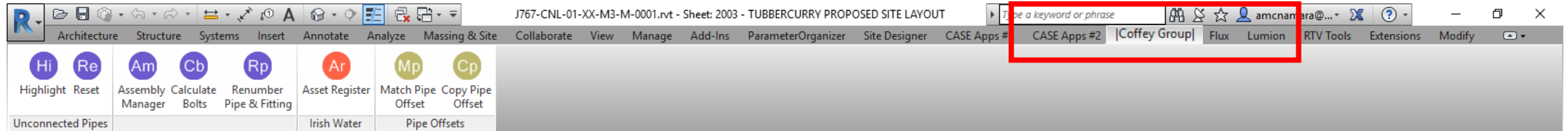


Dynamo

- Tends to scare some users
- Difficult to deploy and manage
- Varies from version to version

Dynamo Player

- Solves some of the above issues
- Still not ideal



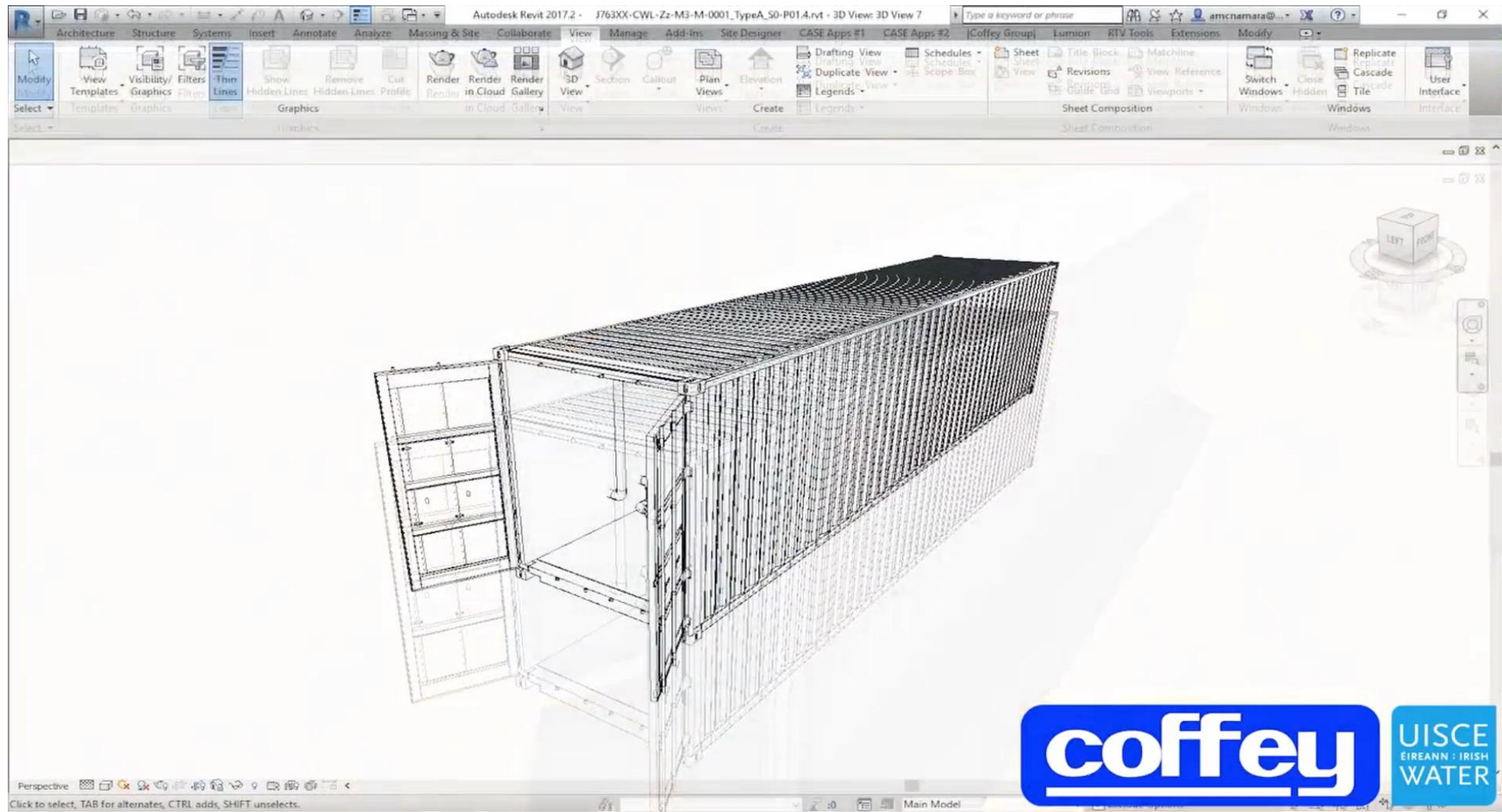
Multiple custom addons to automate and streamline the creation of:

- Transfer Asset data
- 2D and 3D views creation
- Schedules and cut lists creation
- Placing views on sheet
- Tagging all elements in view



Linking to IW's IBM Maximo

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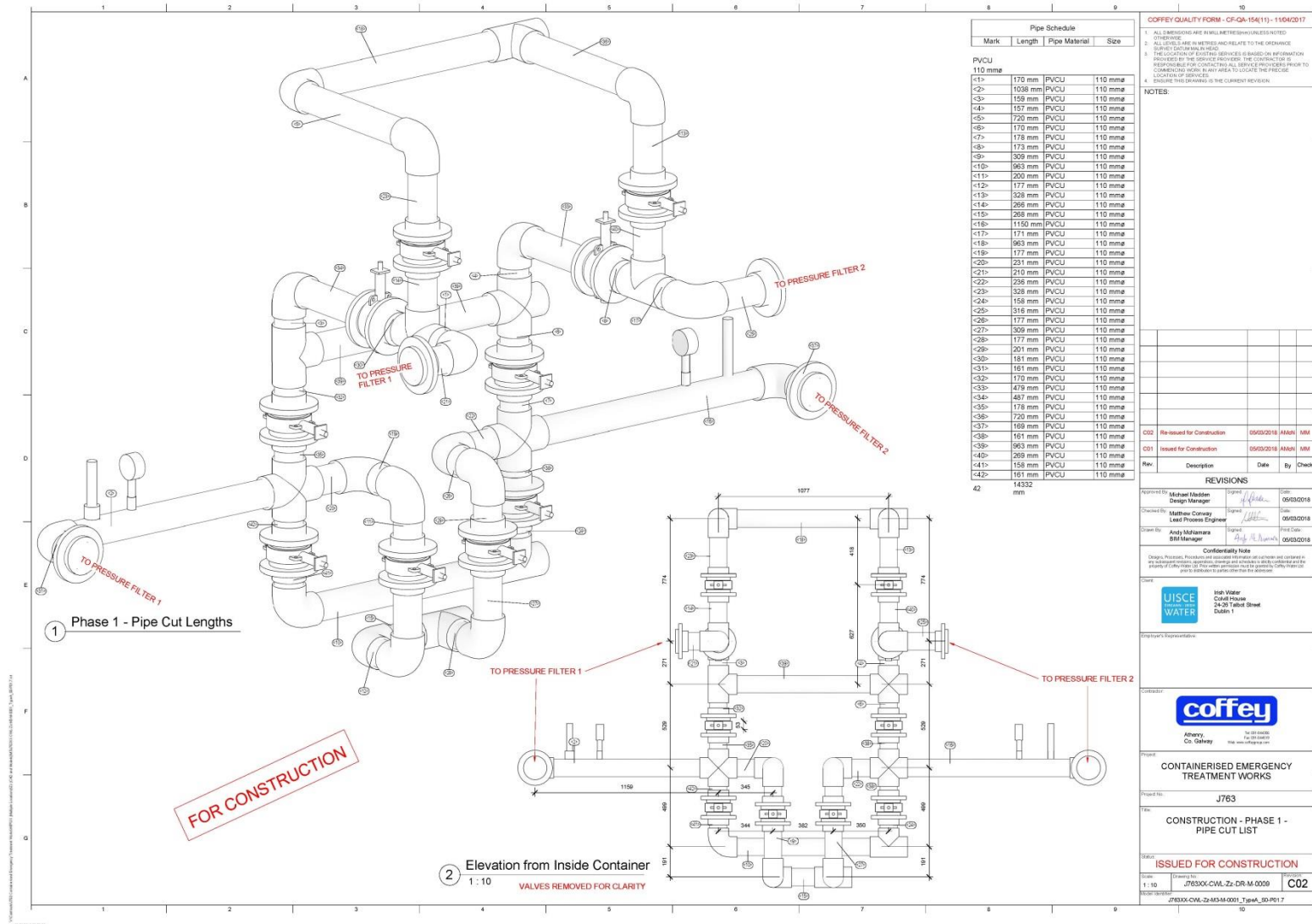


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BIM for Water:

Filtration, Automation & Fabrication

Fabrication



COFFEY QUALITY FORM - CF-QA-154(1) - 11/04/2017

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 2. ALL LEVELS ARE IN METRES AND RELATIVE TO THE ORDNANCE DATUM.
 3. THE LOCATION OF EXISTING SERVICES IS BASED ON INFORMATION PROVIDED BY THE SERVICE PROVIDERS. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL SERVICE PROVIDERS PRIOR TO COMMENCING WORK IN ANY AREA TO LOCATE THE SERVICE.
 4. ENSURE THIS DRAWING IS THE CURRENT REVISION.

NOTES:

Rev.	Description	Date	By	Check
CO2	Re-issued for Construction	05/03/2018	AMM	MM
CO1	Issued for Construction	05/03/2018	AMM	MM

REVISIONS

Approved By: **Michael Hudson** Design Manager
 Checked By: **Matthew Conway** Lead Process Engineer
 Drawn By: **Andy Mahanna** BIM Manager

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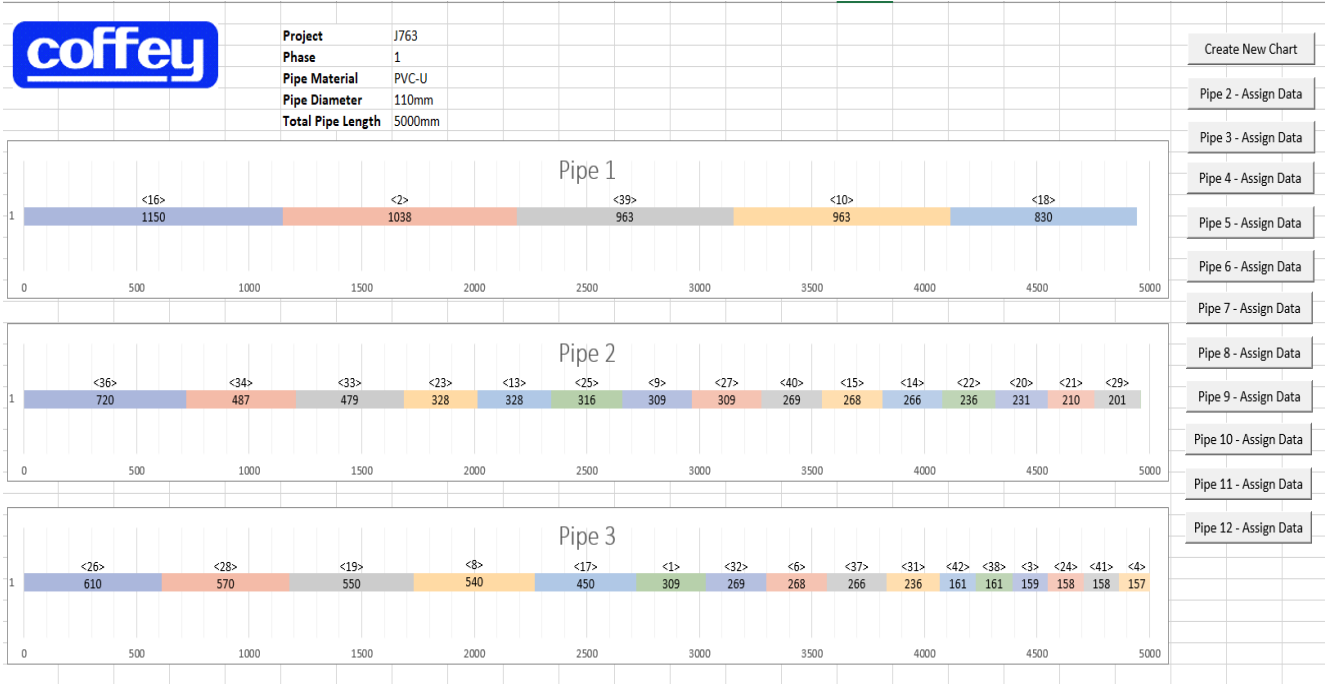
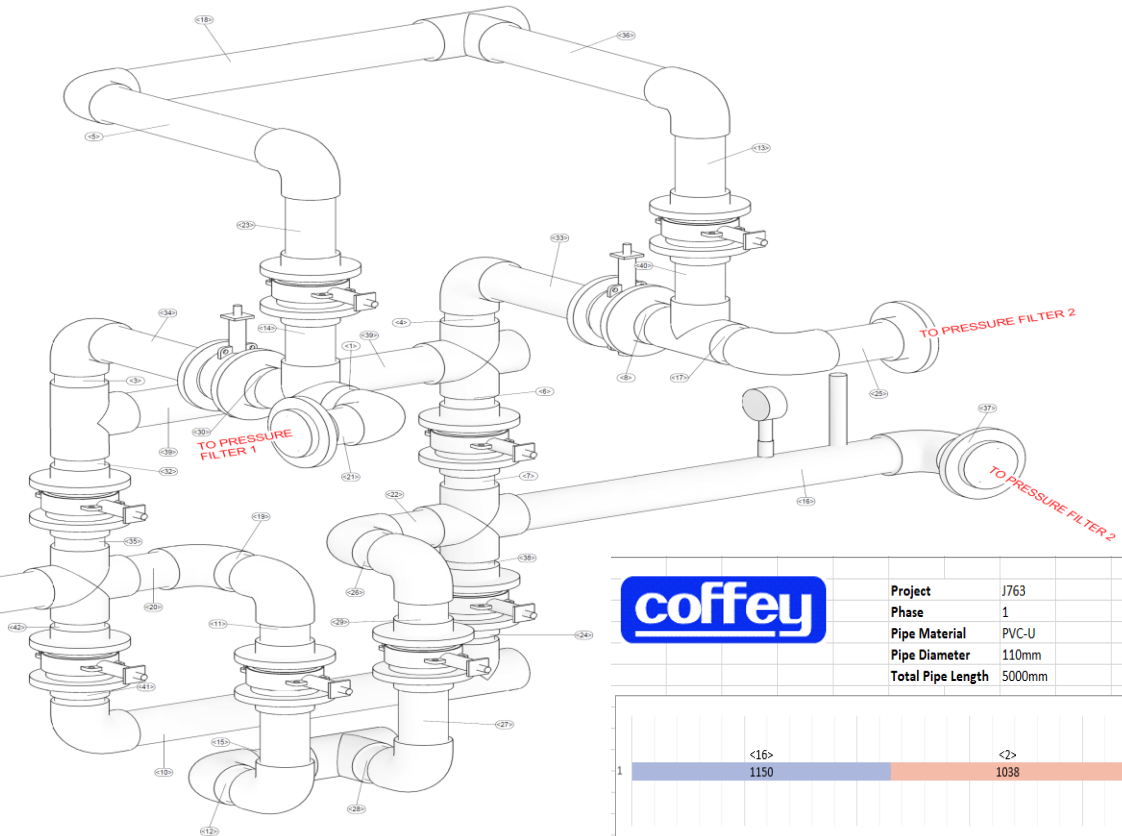
Project: CONTAINERISED EMERGENCY TREATMENT WORKS
Project No.: J763
Title: CONSTRUCTION - PHASE 1 - PIPE CUT LIST

Status: ISSUED FOR CONSTRUCTION
Scale: 1:10
Sheet No.: J763XX-CM-2z-DR-M-0009
Sheet Count: C02
Sheet Path: J763XX-CM-2z-414-M-0001_TipM4_8D_P01 7



Fabrication

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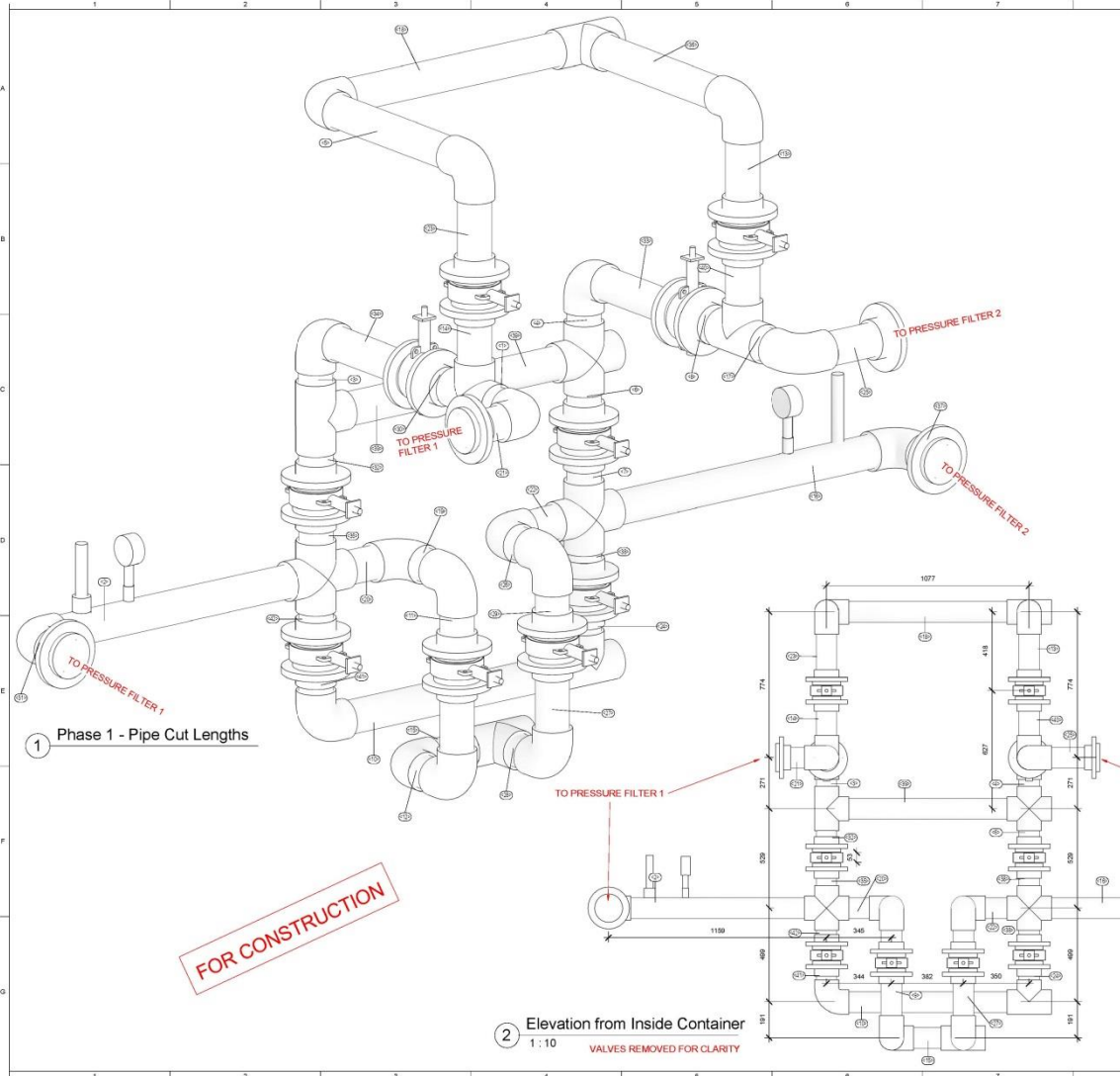
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Mark	Length	Pipe Material	Size

PVCU 110 mmø			
Mark	Length	Pipe Material	Size
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<2>	1038 mm	PVCU	110 mmø
<3>	159 mm	PVCU	110 mmø
<4>	157 mm	PVCU	110 mmø
<5>	720 mm	PVCU	110 mmø
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Fabrication

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Pipe Schedule			
Mark	Length	Pipe Material	Size
PVCU			
110 mm			
<1>	170 mm	PVCU	110 mm
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COFFEY QUALITY FORM - CQ-154(1) - 11/04/2017

1. ALL DIMENSIONS ARE MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL DIMENSIONS ARE DIMENSIONS AND RELATE TO THE ORGANISATION'S SURVEY OR DRAWING, IN THIS CASE.
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4. ENSURE THIS DRAWING IS THE CURRENT REVISION.

NOTES:

Rev.	Description	Date	By	Check
CO1	Re-issued for Construction	05/03/2018	AMM	AMM
CO2	Issued for Construction	05/03/2018	AMM	AMM

REVISIONS

Approved By: Michael Madden, Design Manager, Date: 05/03/2018
 Checked By: Matthew Conway, Lead Process Engineer, Date: 05/03/2018
 Drawn By: Andy Mohamara, BIM Manager, Date: 05/03/2018

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CONTAINERISED EMERGENCY TREATMENT WORKS

Project No: J763

Site: CONSTRUCTION - PHASE 1 - PIPE CUT LIST

ISSUED FOR CONSTRUCTION

Date: 11/10/18, Drawn by: J763XX-CWL-Zz-DR-M-0009, Checked by: C02

Project No: J763XX-CWL-Zz-4154-M-0001_TypA_05-P01.7



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BIM for Water:

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**Augmented
Reality**

VR vs AR

VIRTUAL REALITY (VR)

Completely digital environment



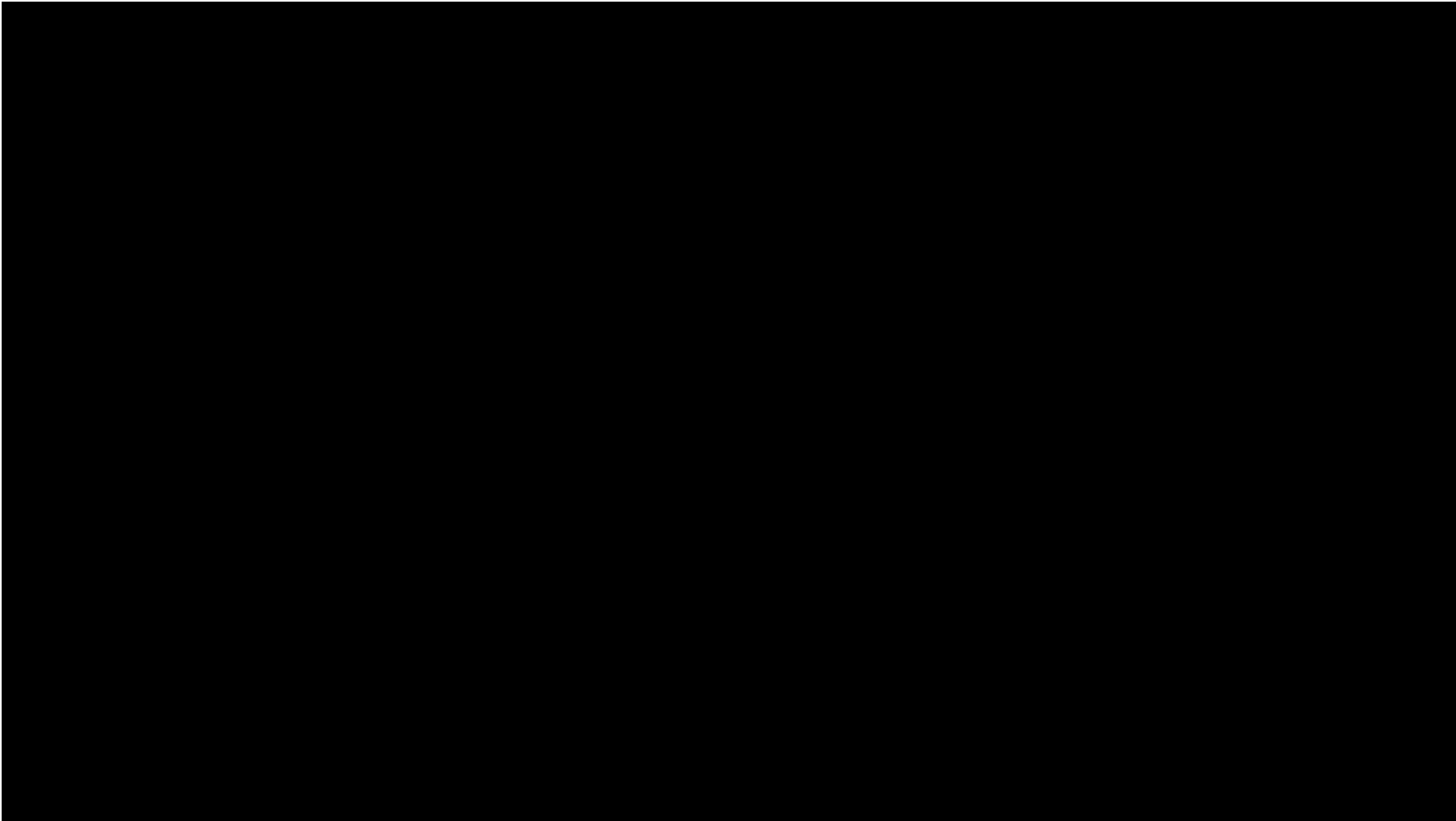
Fully enclosed, synthetic experience with no sense of the real world.

AUGMENTED REALITY (AR)

Real world with digital information overlay



Real world remains central to the experience, enhanced by virtual details.



Thank You
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2017/2018

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