

**Christchurch City Council**

**BIM**

**Changing Asset Management and Project Delivery**

**August 2019**

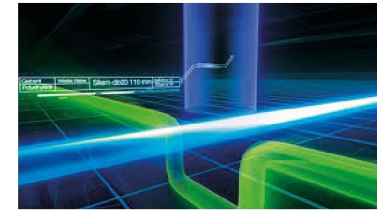
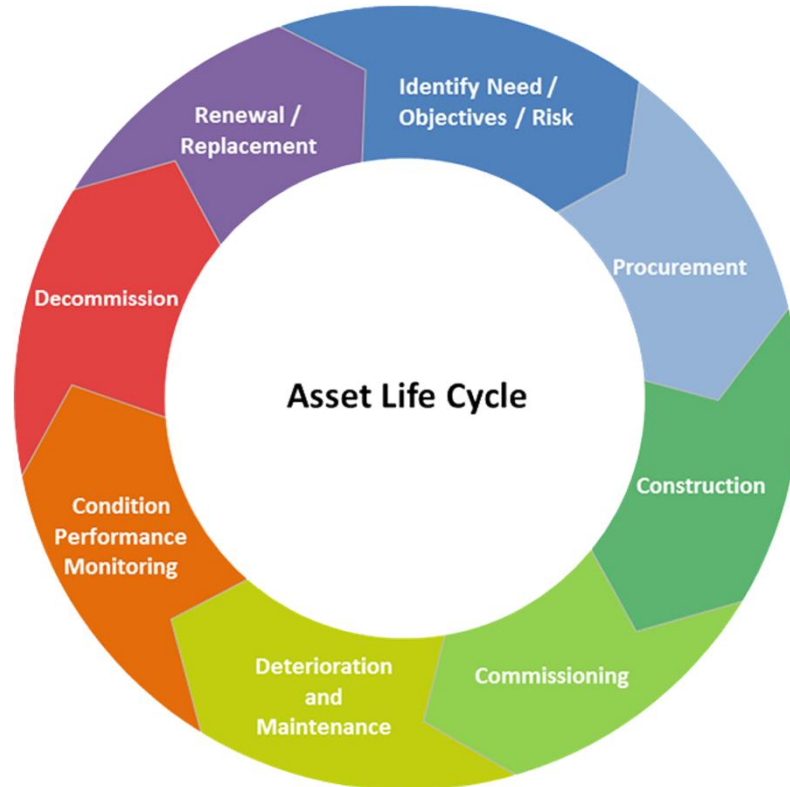
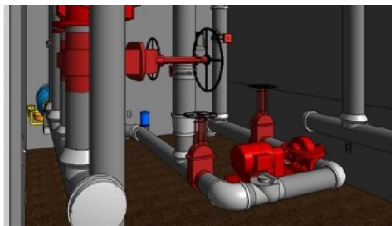
# Run sheet

- CCC BIM Project Overview – 15min
- BIM – how it has changed our approach - 20 min
- Questions – 10 min

# CCC BIM Definition:

***“A 3D representation (digital twin) of the physical, functional AND DATA characteristics of an asset.***

***That digital twin forms a reliable base of information for decisions across the asset lifecycle from concept to disposal”.***



**BIM is NOT**

**Any single act or process**

**A 3 D Model in Isolation**

**A Computer Fabrication**

**BIM IS**

***Being aware of the information needs of others as you go about  
your work***

# **BIM Data Coordination Project**

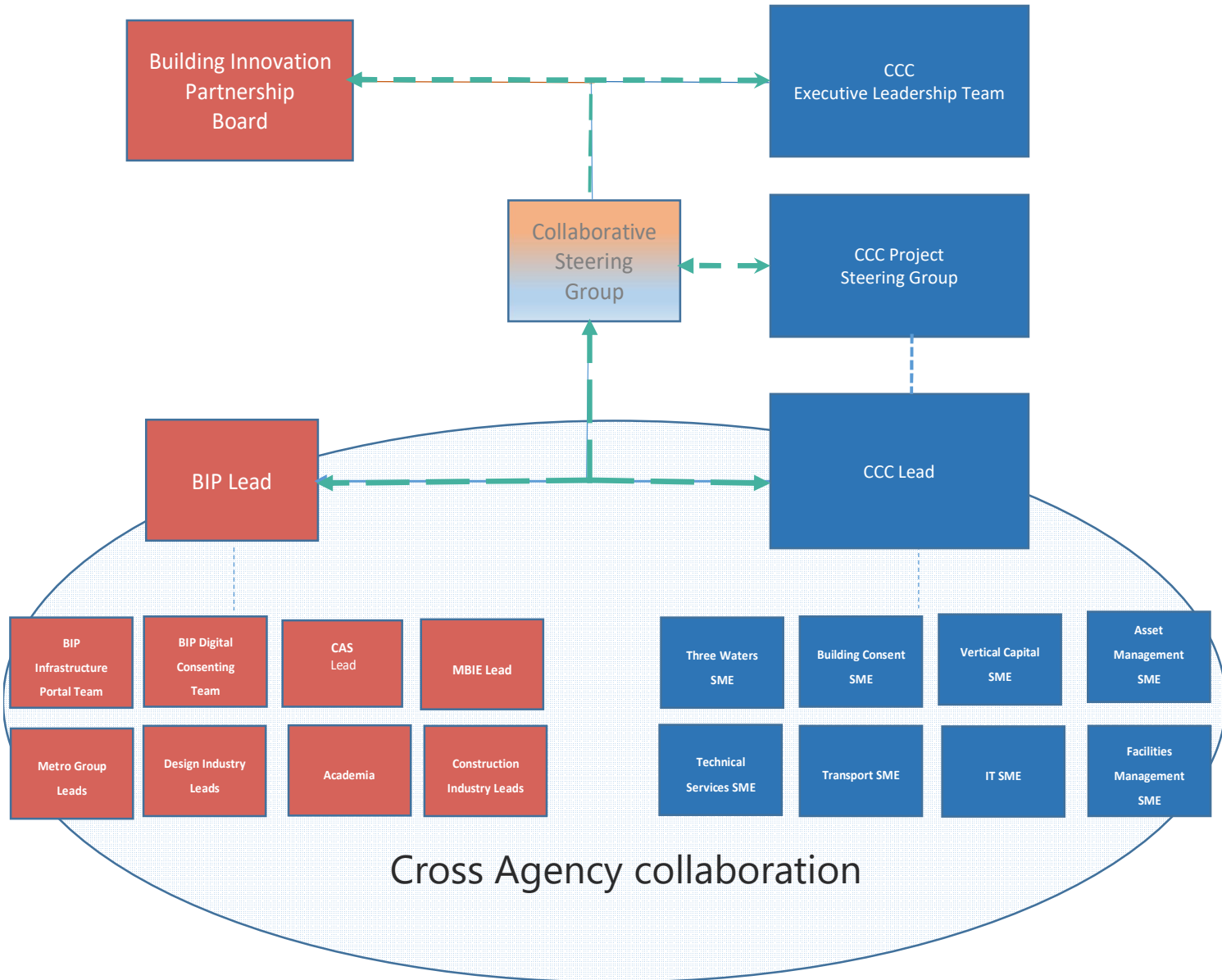
## **Our Objectives**

- **Common BIM Data Requirements in Infrastructure standards and consenting**
- **Common portal for viewing, sharing and collaboration**
- **Open data that is agnostic for input to or consumption by any software**

## **Our approach**

- **8 council teams coordinated to develop data requirements across Consenting, Design, Construction Survey and Asset Management**
- **Utilise existing national and international BIM/ Metadata standards – (don't reinvent the wheel)**
- **Start with lessons learned from Proof of Concept model**

# Project Structure

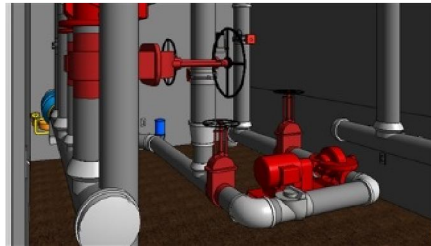


# What benefit does BIM bring?

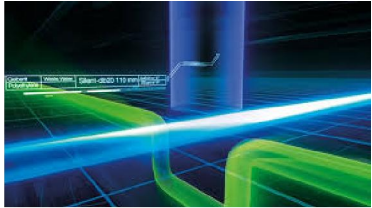
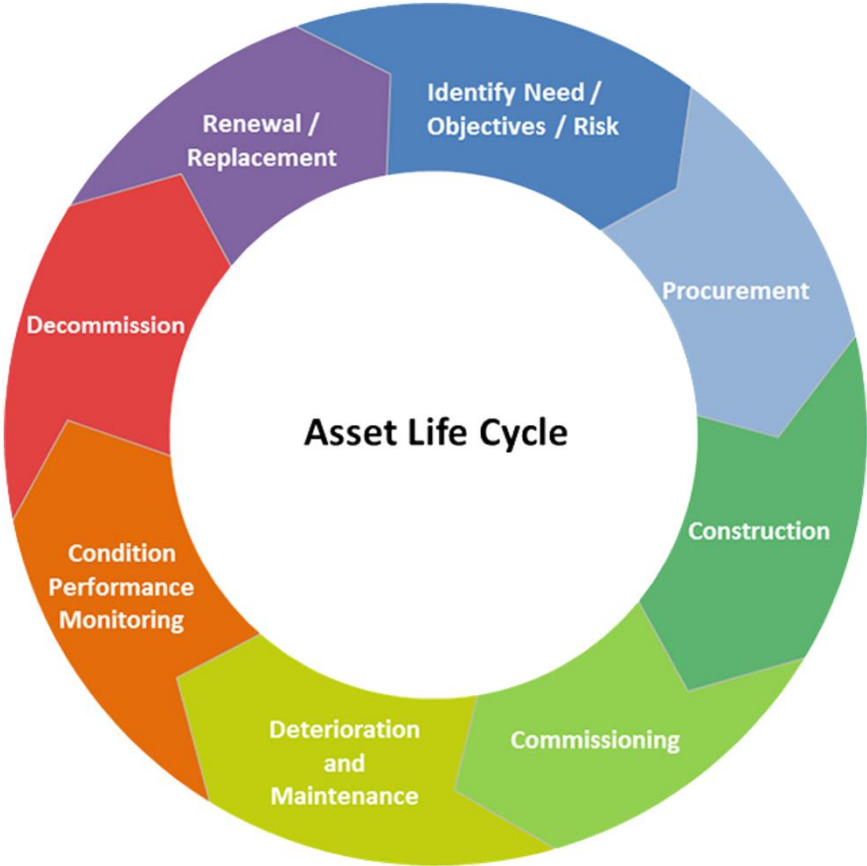
Improves the way we use our data systems and run our business day to day



Turanga



Gardiners Road



Tuam St WW



Cranford St



# Collaboration across an asset's lifecycle

## Data sources and Control points

## Stakeholders

- Concept Design Model
- Detailed Design Model
- Building Consent Model
- Construction Model
- As-built Model
- SCADA Control Networks
- Asset Management System
- Document management System
- External Agencies

- Asset Management
- Facilities Management
- Compliance and Enforcement
- Transport Mgmt
- Water Services
- Community Engagement
- Industry Coordination and Collaboration
- Regional collaboration

Open BIM Data in IFC compatible format



*By utilizing a Digital Twin portal for viewing and management of assets and their associated data, the opportunity for collaboration and data sharing expands exponentially.*



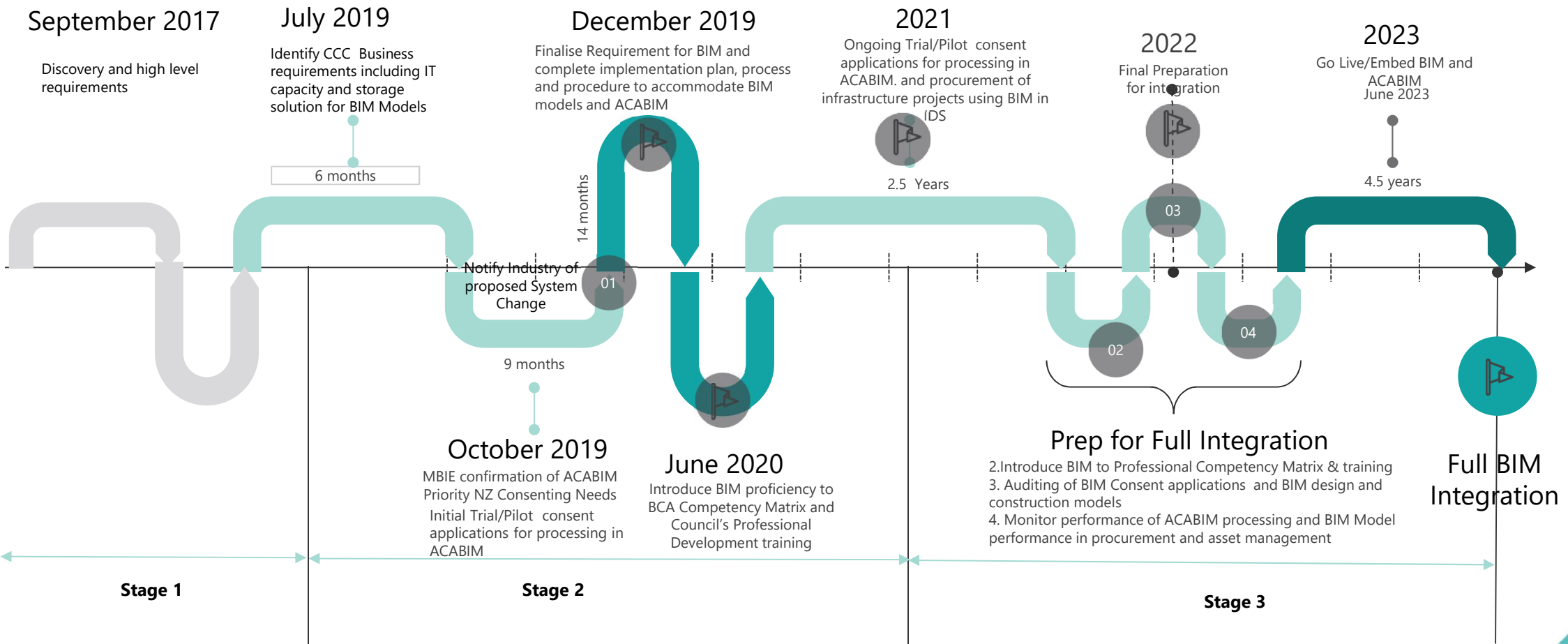
# STAKEHOLDER ENGAGEMENT



[Turanga - New Central Library](#)

# BIM Consenting and Infrastructure Implementation - A plan for the future

September 2019



## Tangible Benefits so Far

Efficiency gains	Facilities	3 Waters and Transport	Consenting and Compliance	Asset Management
More collaboration during Design and Construction	✓	✓	✓	✓
Improved clash detection	✓	✓	✓	
Higher accuracy in asset data capture	✓	✓	✓	✓
Automated Data upload				✓

# Consenting and Compliance - Context

## MBIE/BRANZ

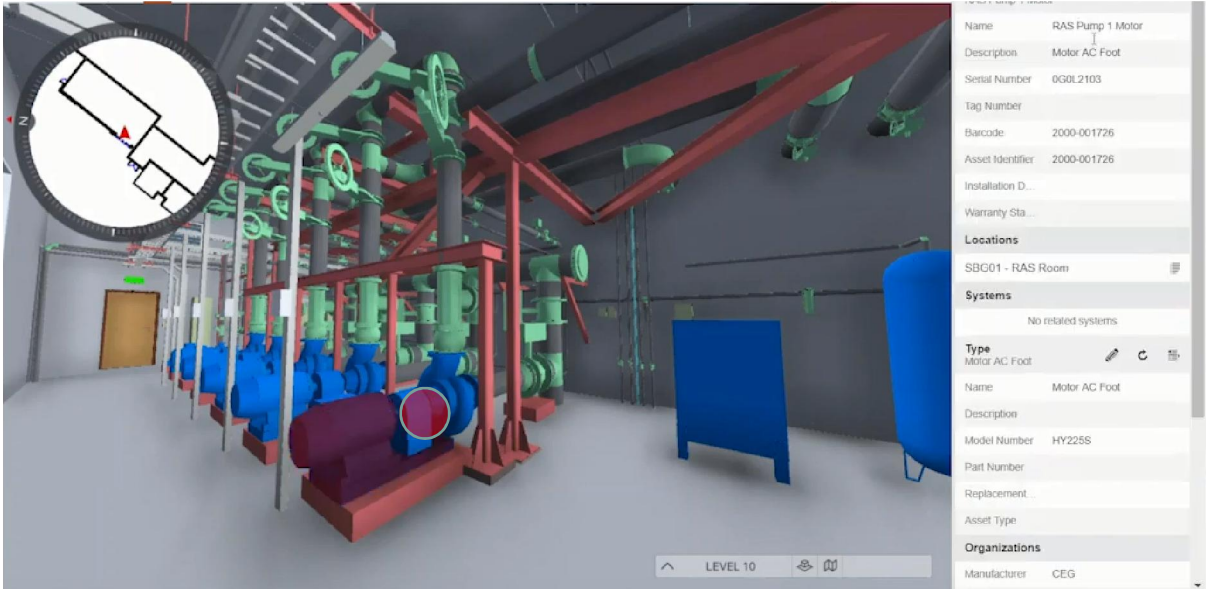
CCC support of ACABIM and translating 15 key Building Code key clauses



**Ministry of Education/UC – Trial and Pilot Linwood College, Uni Rec Centre**

# Horizontal Infrastructure Context

- 3D Designs (12d, REVIT) incorporating As Built requirements
- Gardiners Rd Pump Station – retrospective modelling for detailed asset data
- 3D enabled SAP/GIS
- Integration with SAP works orders/contractor works management



# What about PMBOK?





# Initiate

**Start with the end in mind:**

- **What information do we actually need to run our business**
- **Levels of Development(LOD)**

# 100 or 500??

*Model detail increases over time*



# LOD - Not just Building and Construction projects...



# Planning – get the basics right



# Scope

- **Easier Client engagement**
- **Cross discipline collaboration**
- **Level of Development**



# Schedule

- **Clash detection**
- **Collaboration**



# Cost

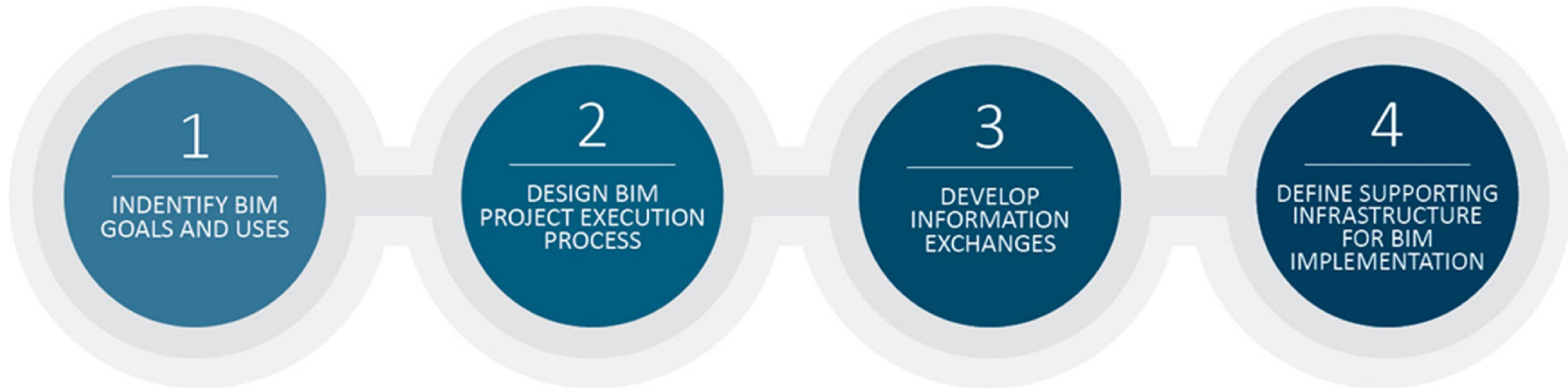
- Mitigate Clashes
- Minimise Scope Creep

Design								Construction		Operation	
Task		MEA						Contractors BIM Tasks		FM BIM Tasks	
Existing Conditions Modelling	✓	CV	L	A				Existing Conditions Modelling	✗	Existing Conditions Modelling	✗
Design Authoring	✓	A	S	MEP	F	L	CV	Site Utilization Planning	✓	Maintenance Scheduling	✗
Design Reviews	✓	A	S	MEP	F	L	CV	Construction System Design	✗	Asset Management*	✓
3D Design Coordination	✓	A	S	MEP	F	L	CV	3D Coordination	✓	Space Management / Tracking	✗
Structural Analysis	✗							Digital Fabrication	✗	Disaster Planning	✗
Lighting and Energy Analysis	✗							3D Control and Planning	✗	Record Modelling (As Built)	✓
Mechanical Analysis	✗							Record Modelling	✓		
Sustainability (Greenstar) Evaluation	✓	A	MEP	F				Construction Programming (4D Modelling)	✓		
Building Code and Health/Safety Review (manual check only)	✓	A	S	MEP	F	L	CV	Cost Estimation (5D Modelling)	✓		
Phase Planning (4D Modelling)	✗										
Cost Estimation (5D Modelling)	✓	QS									



# Resources

**Collaboration – well defined roles and responsibilities**





# Quality

## Quality control checks

The following checks should be performed to assure quality within models and information, to eliminate errors and achieve desired project outcomes. These checks are intended to be carried out internally by the BIM Coordinator.

CHECK:	DEFINITION:	RESPONSIBLE PARTIES:	PROJECT STAGE:	FREQUENCY:
Visual check	See that there are no unintended model components and the design intent has been followed			
Interference check	Detect problems in the disciplines model where two components are clashing including soft and hard			
Model integrity checks	Ensure integrity of the model aligns with BIM Uses and client's BIM specific modelling and documentation requirements and standards, as set out in Model Standards			
Design review	Review that the ongoing development of the model is aligned with the client objectives.			
Authoring software warnings				

# Risk

Mitigates some risk but is NOT a silver bullet



# Procurement

**BEP as a contract document**

- **Clearly defines of Contract roles and responsibilities**
- **Provides detailed business requirements**
- **Sets Stakeholder expectations**

# Execute

**Collaboration and coordination with intent.**

# Monitoring and Control

- **Collaboration**
- **Iterative models**

# Closing

- **Handover Process**
- **As Built data upload**

# Integration

- **Start with the end in mind**
- **Cross discipline coordination and collaboration**
- **Stakeholder engagement**

# Key messages

