

# **BIM Management Services**

## **Life-Cycle BIM**

**THE  
BUILDING  
INTELLIGENCE™  
GROUP**

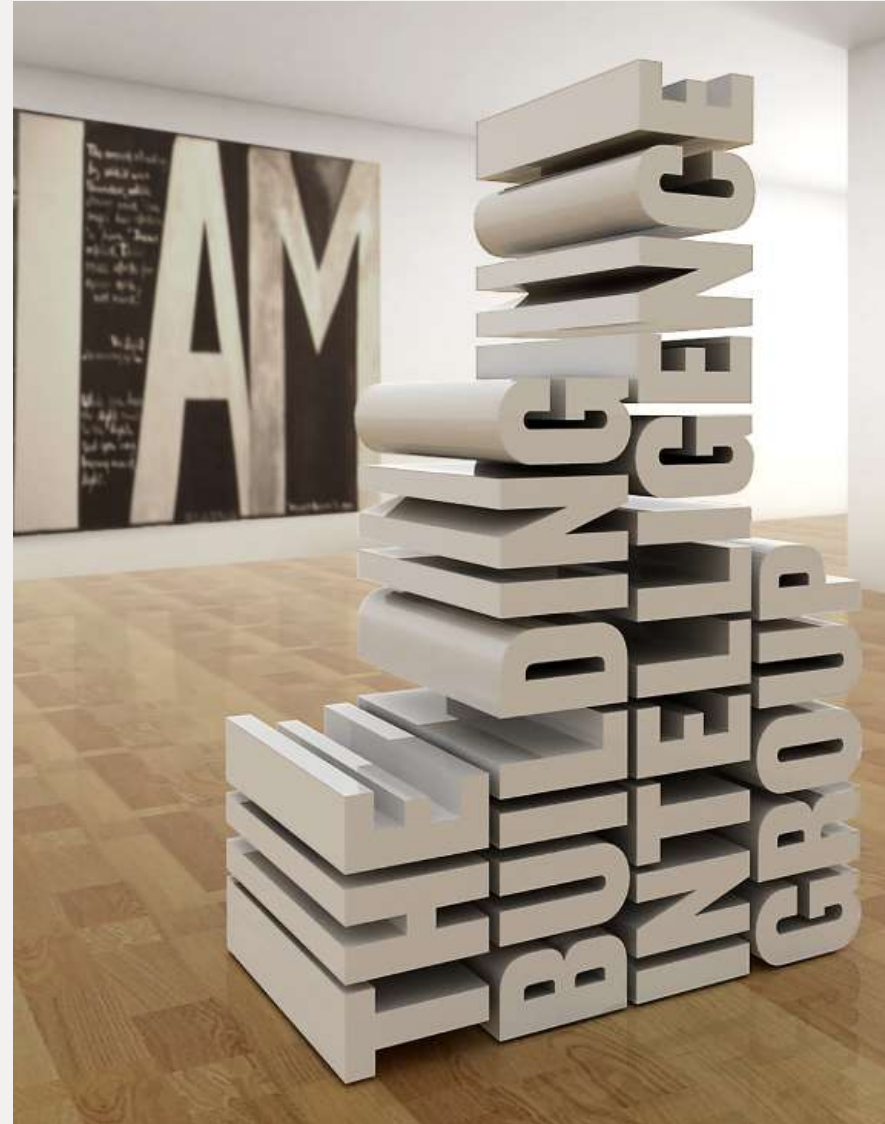
# Contents

- 1.0 Who we are
- 2.0 Independence
- 3.0 NZ Capability
- 4.0 Dave Ebbett
- 4.0 Collaborative Teams
- 5.0 Asset Life Cycle
- 6.0 BIM
- 7.0 Communication
- 8.0 Q&A



# Who We Are

- We provide independent project management services to organisations requiring innovation and project success.
- 24 Year track record.
- Sector wide experience.
- A new generation of project management.
- ISO 9001: 2008 Certified.



# What Independence means

- We have no affiliations to suppliers, contractors or designers. We're on your team – no one else's.
- We make the tough calls so all decisions are in your best interests.
- The only hat we wear is that of a trusted advisor.



# We think and act NZ wide

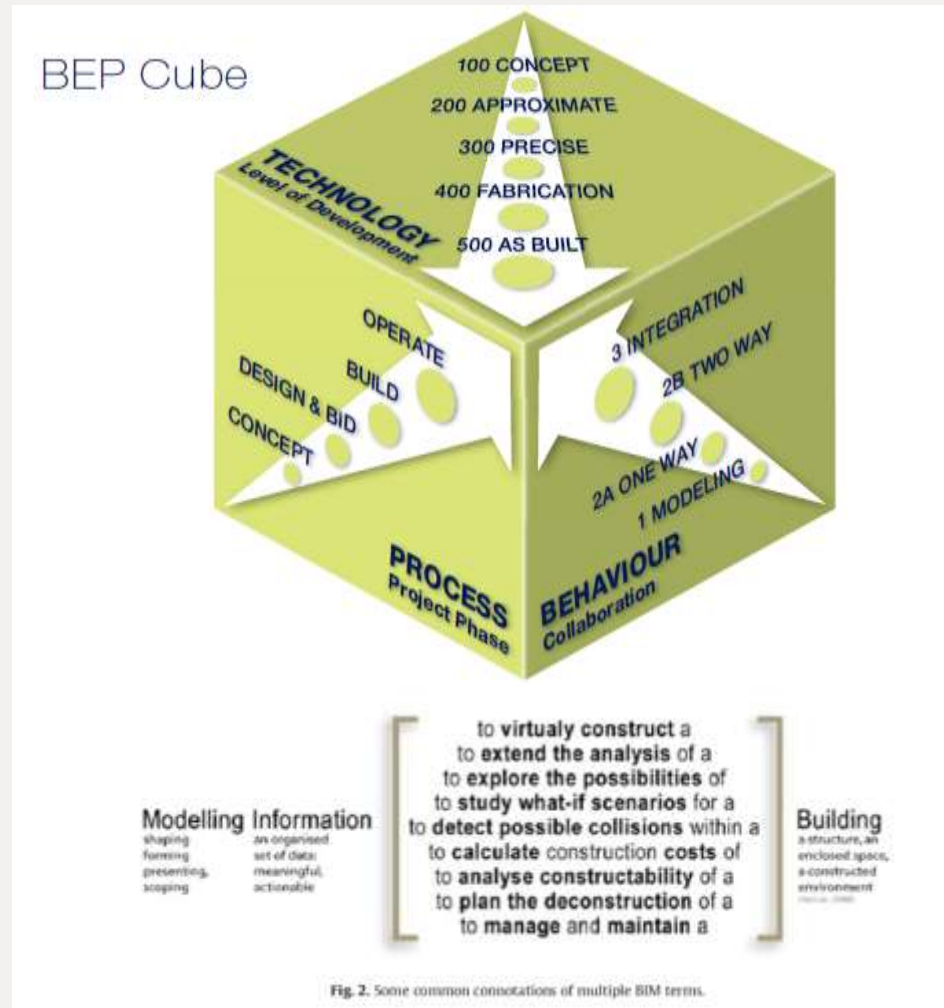
- We have offices in Auckland, Wellington, Tauranga and Christchurch.
- We can apply resources and skills *where* and *when* its needed.
- Local knowledge.
- National and international projects.



# Dave Ebbett

Introducing:

Dave Ebbett  
Project Manager





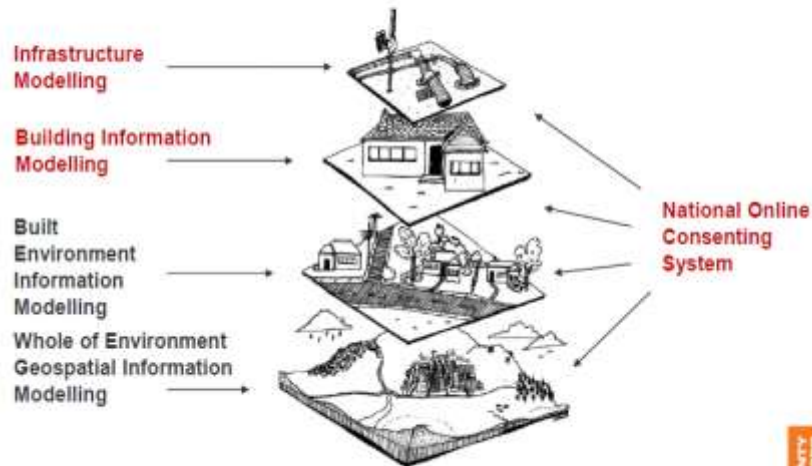
# Dave Ebbett



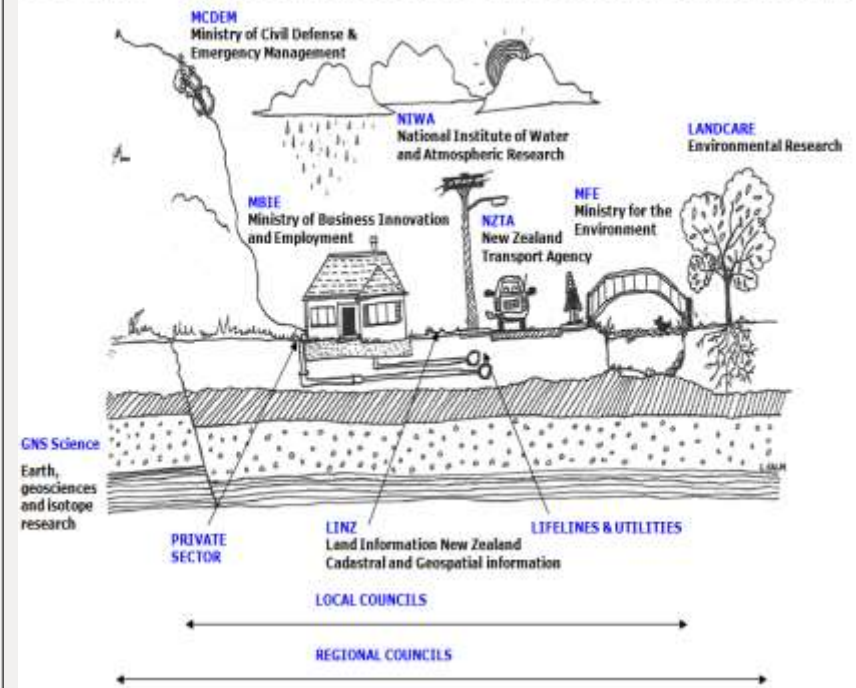
# Productivity Partnership

- BIM Handbook
- NZ BIM Schedule

## The long game

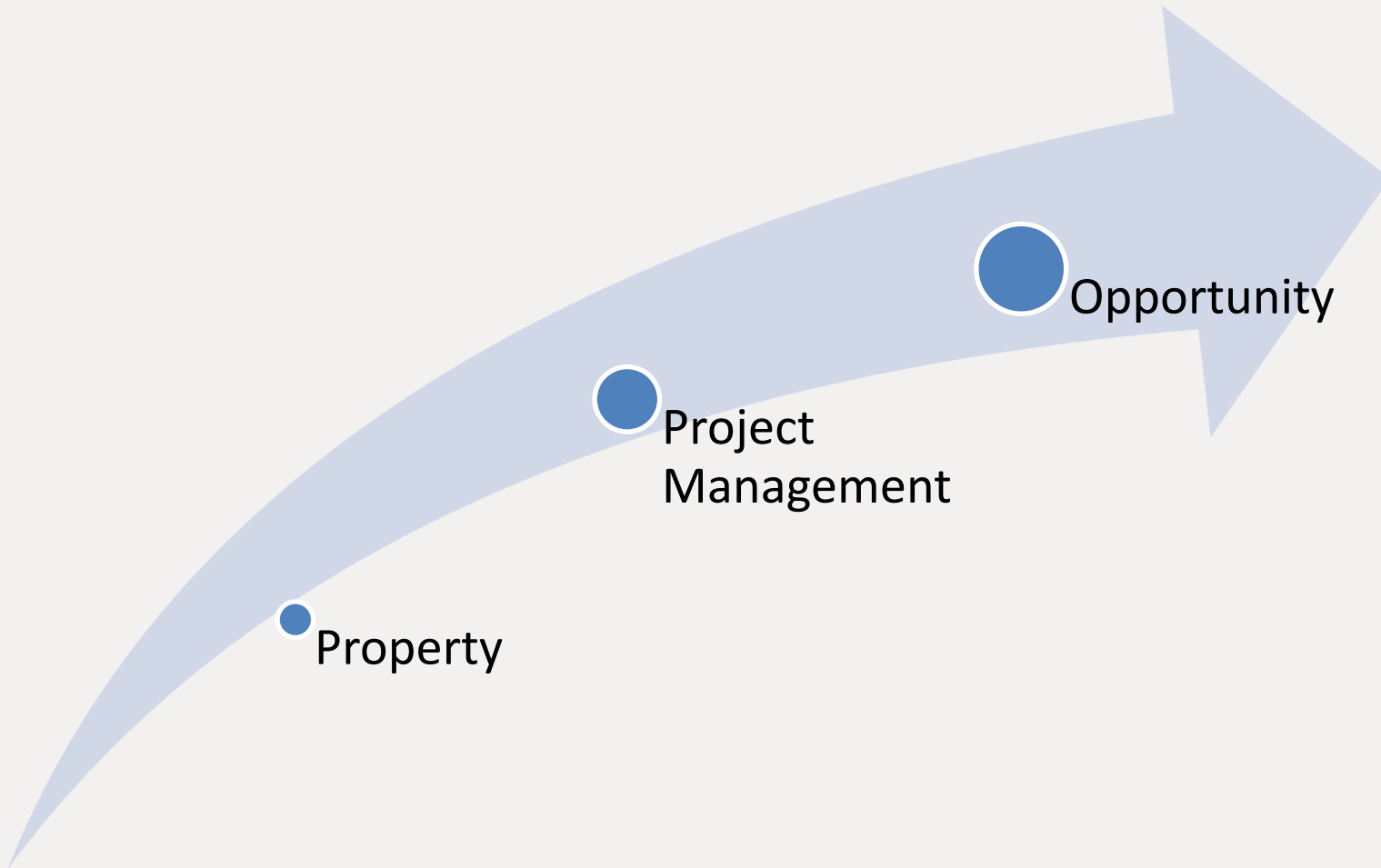


## GeoBuild™ – an Interoperable Whole Environment Information Model

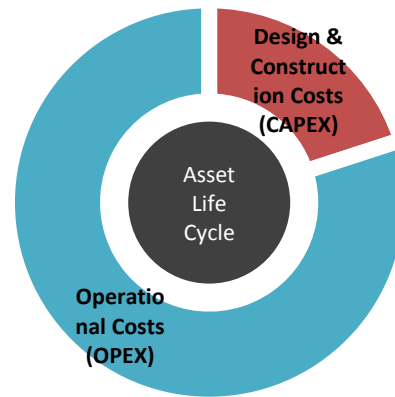


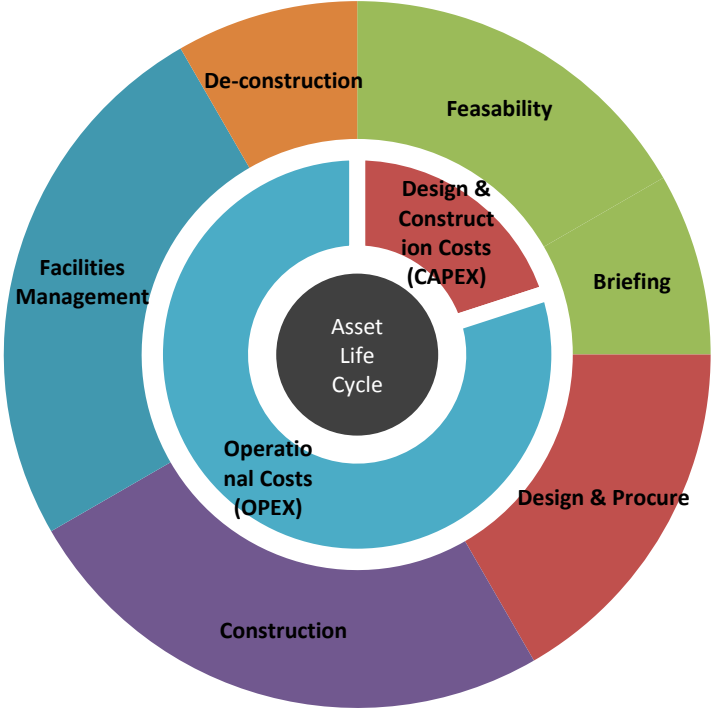


# Asset Life Cycle



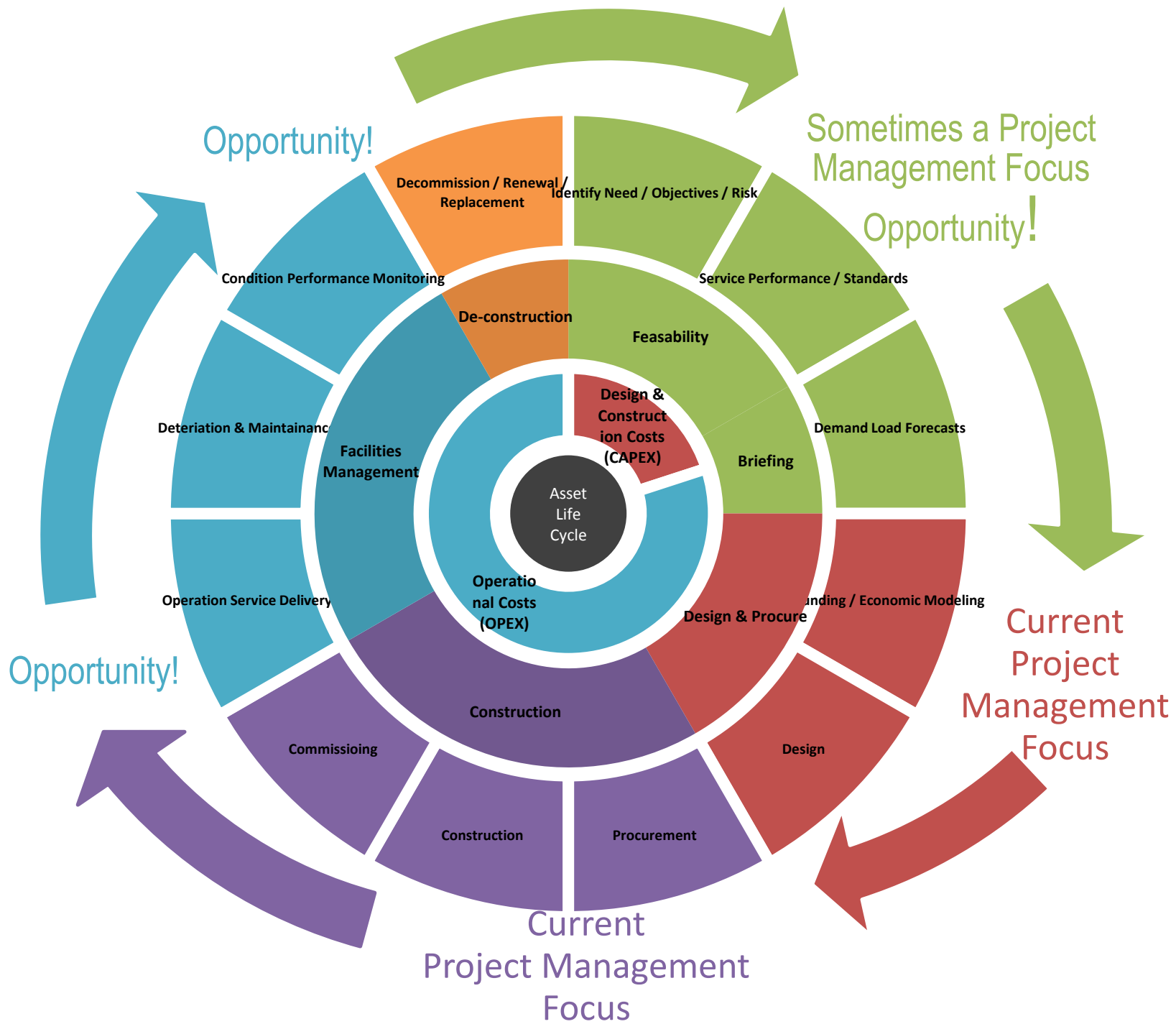
Asset  
Life  
Cycle









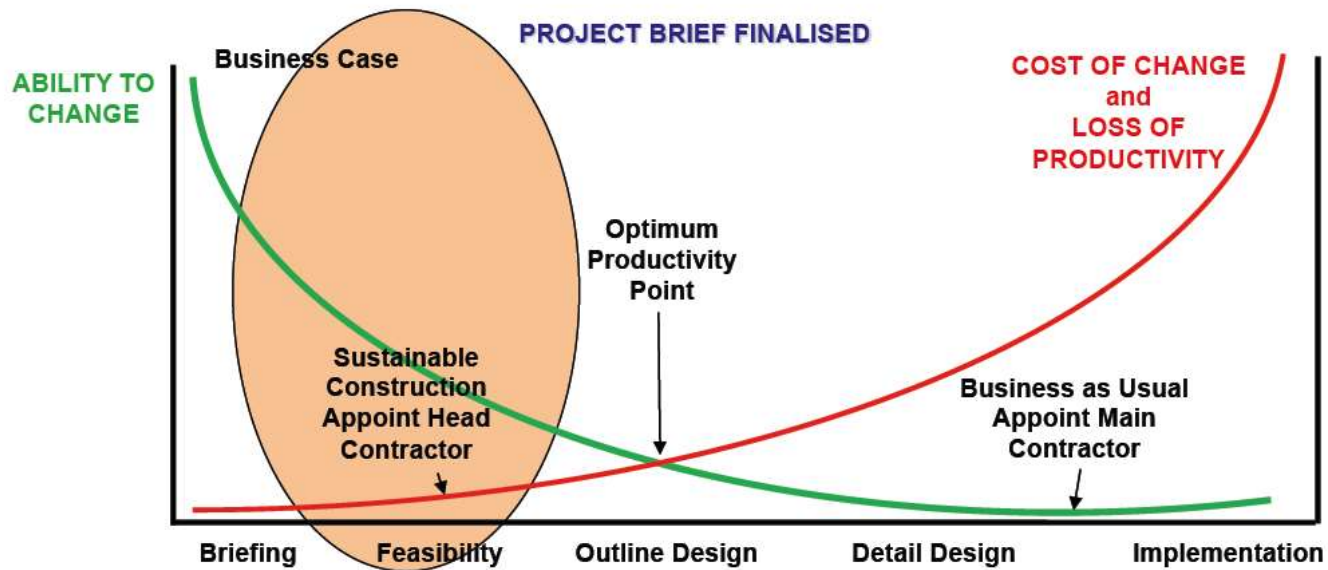


# Why it matters

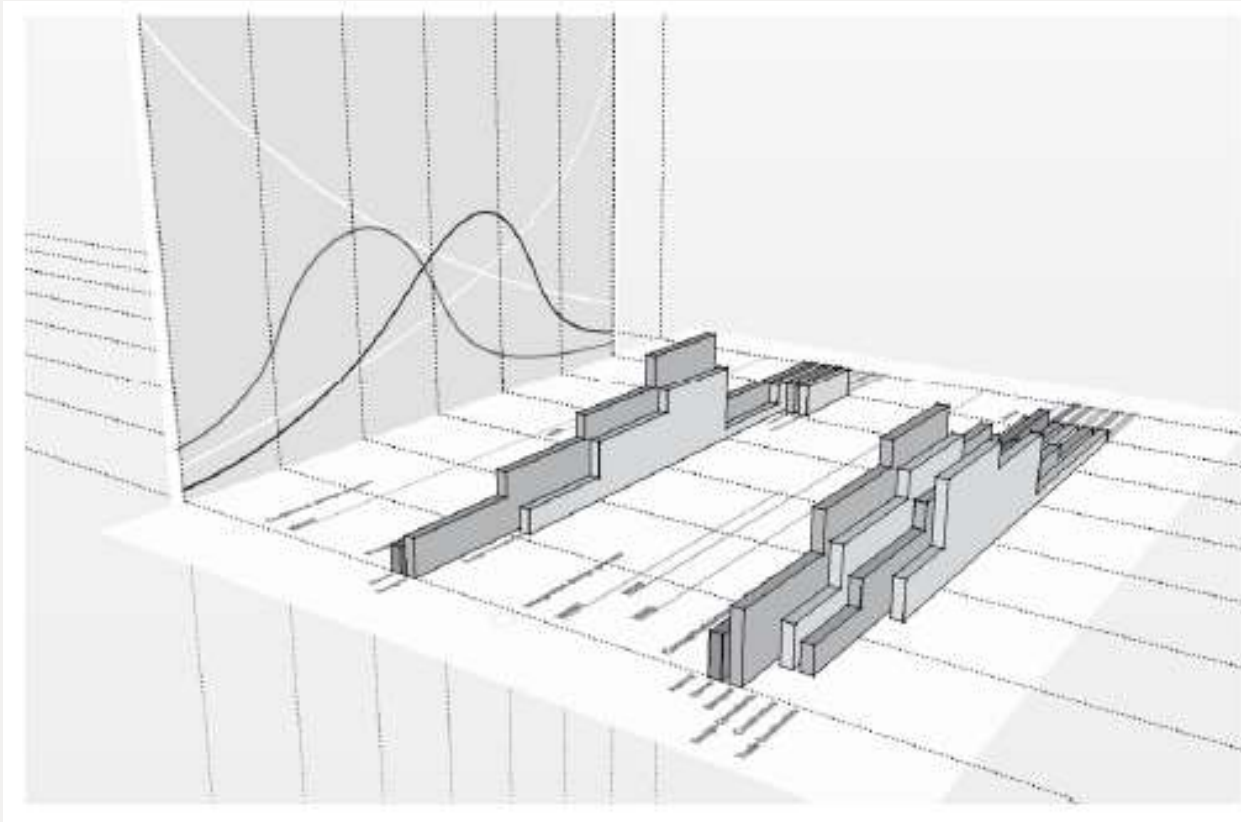
TWENTY BY 2020

## APPOINTMENT OF INTEGRATED PROJECT DELIVERY TEAM

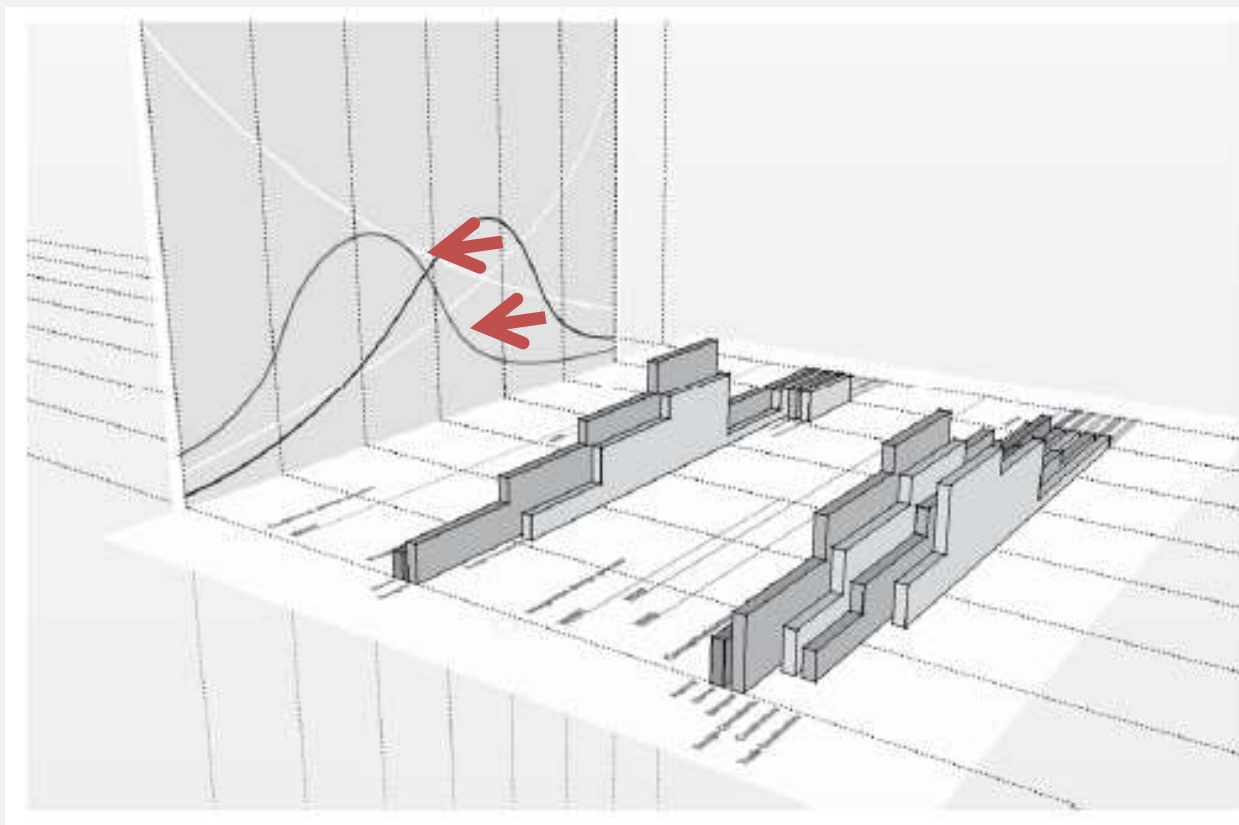
UNLOCKING VALUE ADDED BENEFITS AND MAXIMISING PRODUCTIVITY



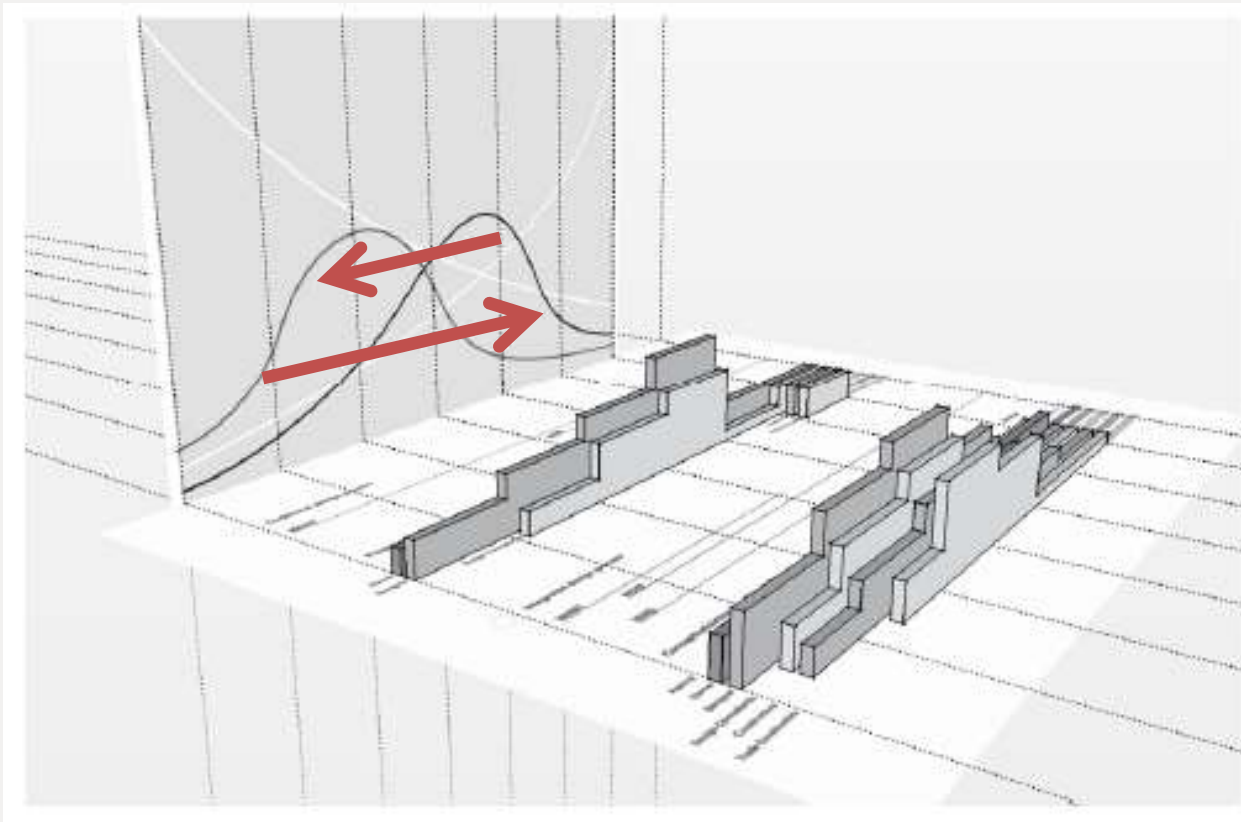
# Why it matters – Lessons Learnt



# Why it matters – Lessons Learnt

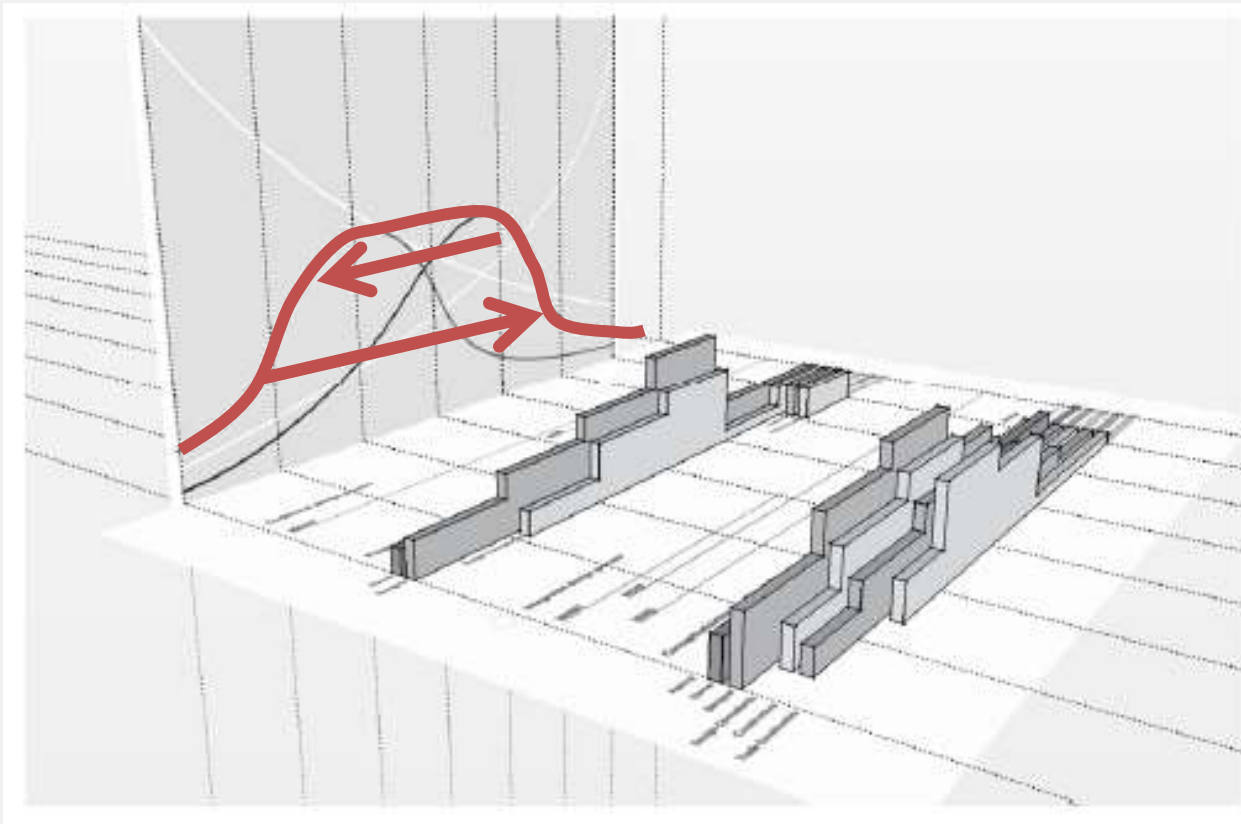


# Why it matters – Lessons Learnt





# Why it matters – Lessons Learnt



# Why it matters - IPD

## Traditional Project Delivery

Fragmented, operating in disjointed silo's,  
Assembled on "just-as-needed" or "minimum necessary" basis  
strongly hierarchal, controlled, authoritarian

Linear, distinct, segregated  
Knowledge gathered "just-in-time"  
Information hoarded, knowledge, skills and Information loss

Individually managed  
Transferred to the greatest extent possible

Individually pursued  
Minimum effort for maximum return  
(Usually) first cost based

Paper-based  
2 dimensional  
analog

Encourage unilateral effort  
allocate and transfer risk  
no sharing

vs

## TEAMS

## PROCESS

## RISK

## COMPENSATION REWARD

## COMMUNICATIONS TECHNOLOGY

## AGREEMENTS

## Integrated Project Delivery

An integrated team entity composed of key project stakeholders  
Assembled early in the process to optimise added value  
Open, Linear, transparent and collaborative

Concurrent and multi-level  
Early contributions of knowledge and expertise  
Information openly shared, stakeholders must trust and respect

Collectively managed  
Appropriately shared

Team success tied to project success  
Best for project orientated  
Value-based

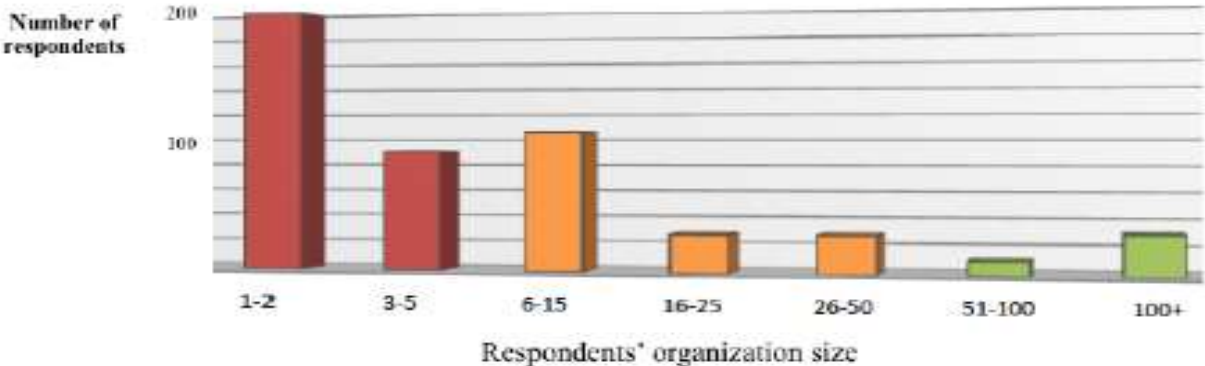
Digitally based, virtual  
building Information modelling  
3, 4, 5, & 6 Dimensional

Encourage, foster, promote and support  
multi-lateral sharing and collaboration  
Risk sharing

# Masterspec BIM Survey(s)

## ~Masterspec NZ BIM Survey 2012~

Numbers of survey respondents by organization size



Respondents' industry organization size

Number of respondents

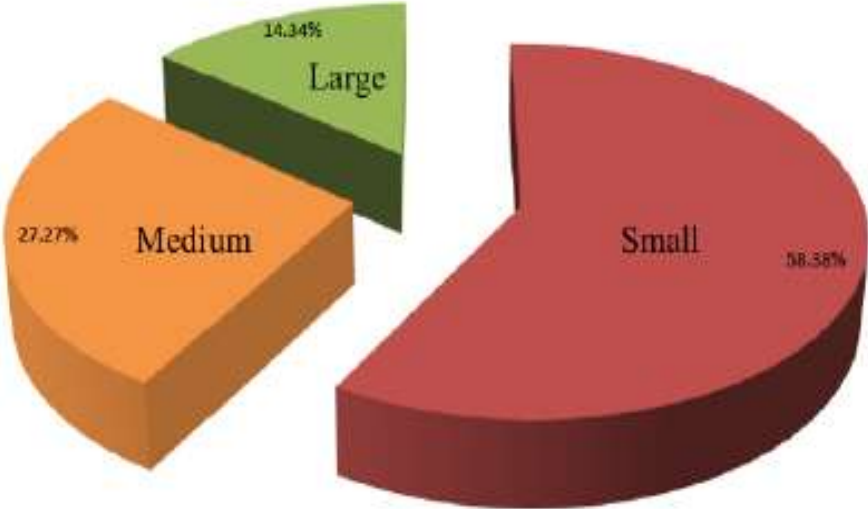
1-2	3-5	6-15	16-25	26-50	51-100	100+
198	91	106	29	29	11	31

Figure 1. Masterspec NZ BIM Survey 2012: Numbers of survey respondents by organization size

# Masterspec BIM Survey(s)

Respondents firm organization size

Industry sector view



sector size % of industry

Figure 2 Respondents firm organization size: Industry sector view

# Masterspec BIM Survey(s)

End of survey - Open ended question:  
any other comments?

## BIM barrier responses

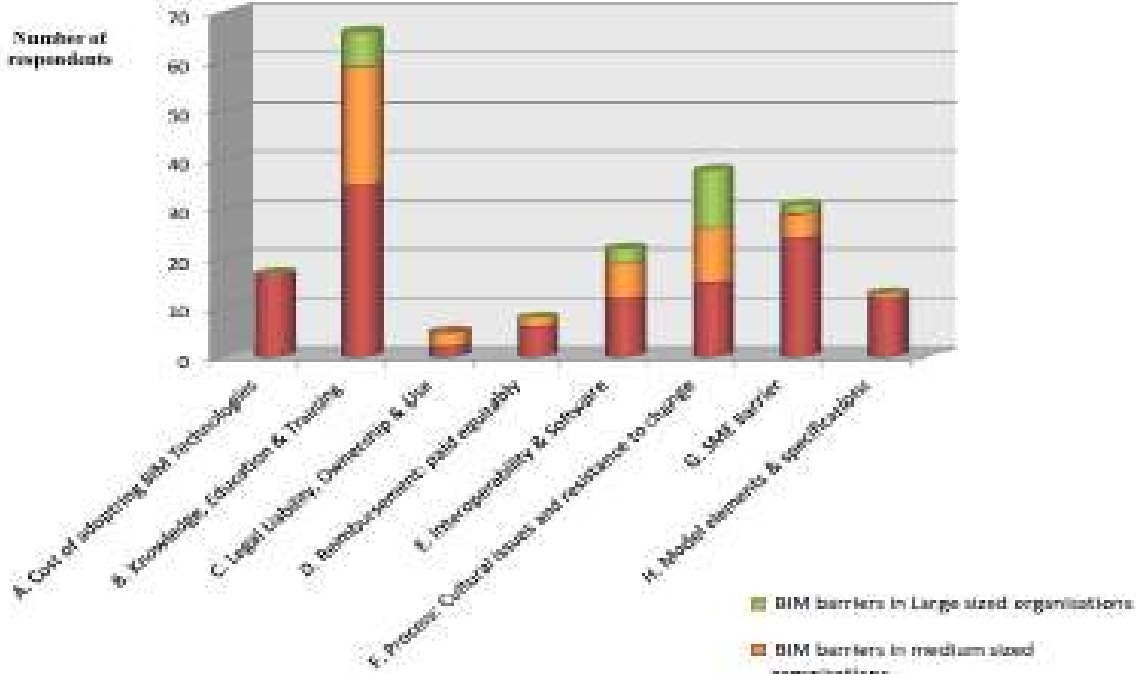


Figure 35. End of survey - Open ended question: any other comments? BIM barrier responses



# BIM Management





# Grace Norfolk Southern Cross Hospital



Existing and Consented Buildings



Permitted Baseline for Development – 9m

# Grace Norfolk Southern Cross Hospital



Existing and Consented Buildings

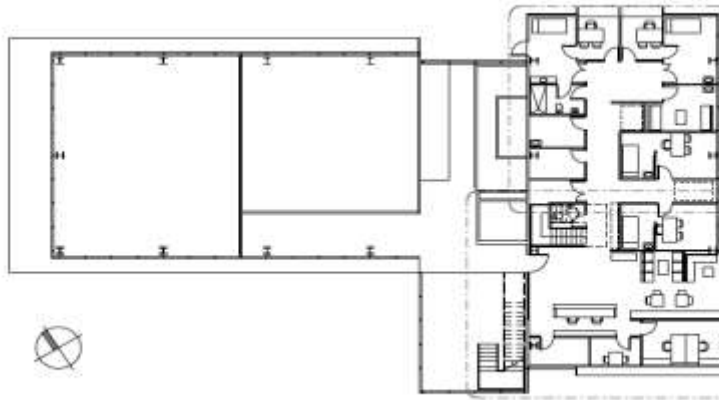


Permitted Baseline for Development – 9m

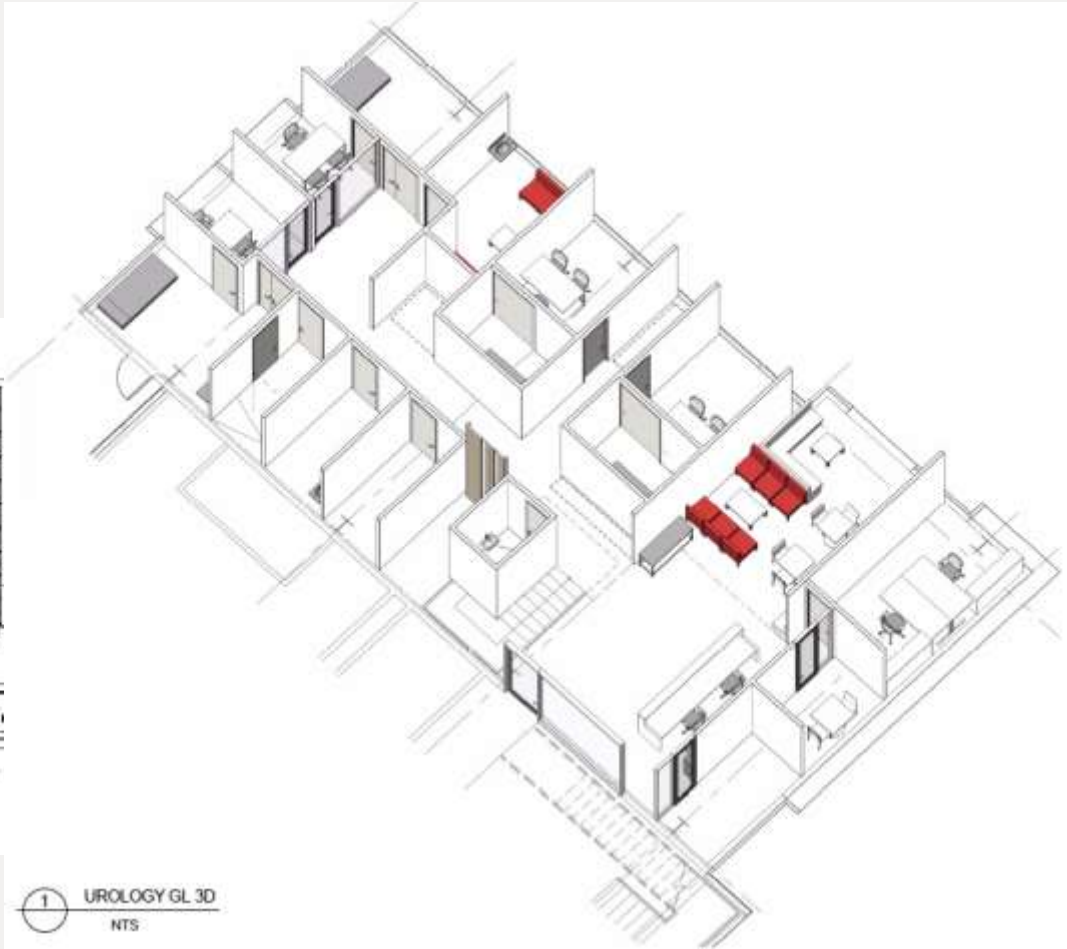
# BIM Management



# BIM Management

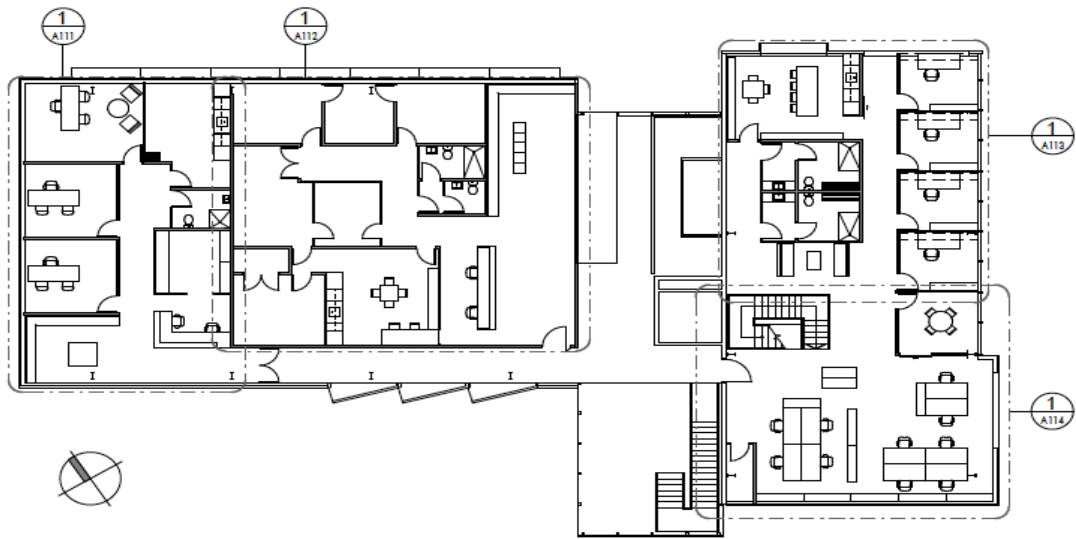


1 GROUND FLOOR GIA PLAN  
1:200 @A3



1 UROLOGY GL 3D  
NTS

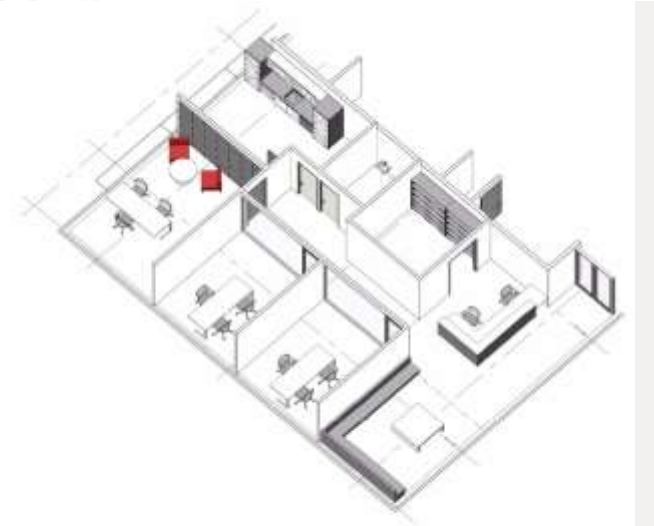
# BIM Management



1 LEVEL 1 O/A PLAN  
1:200 @A3



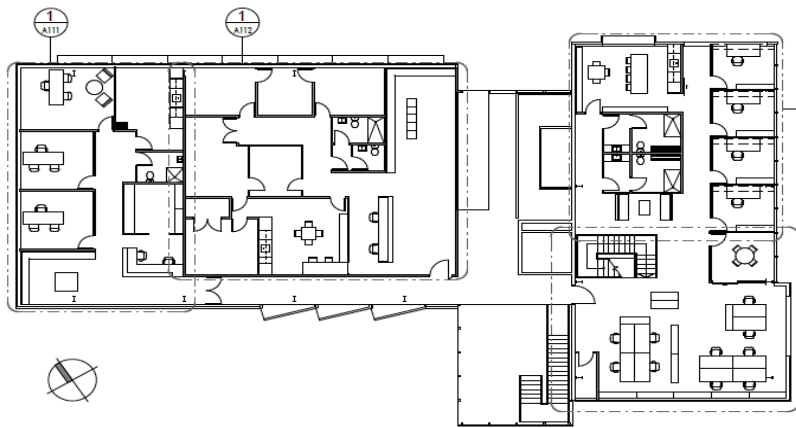
1 GYNAECOLOGY 3D  
NTS



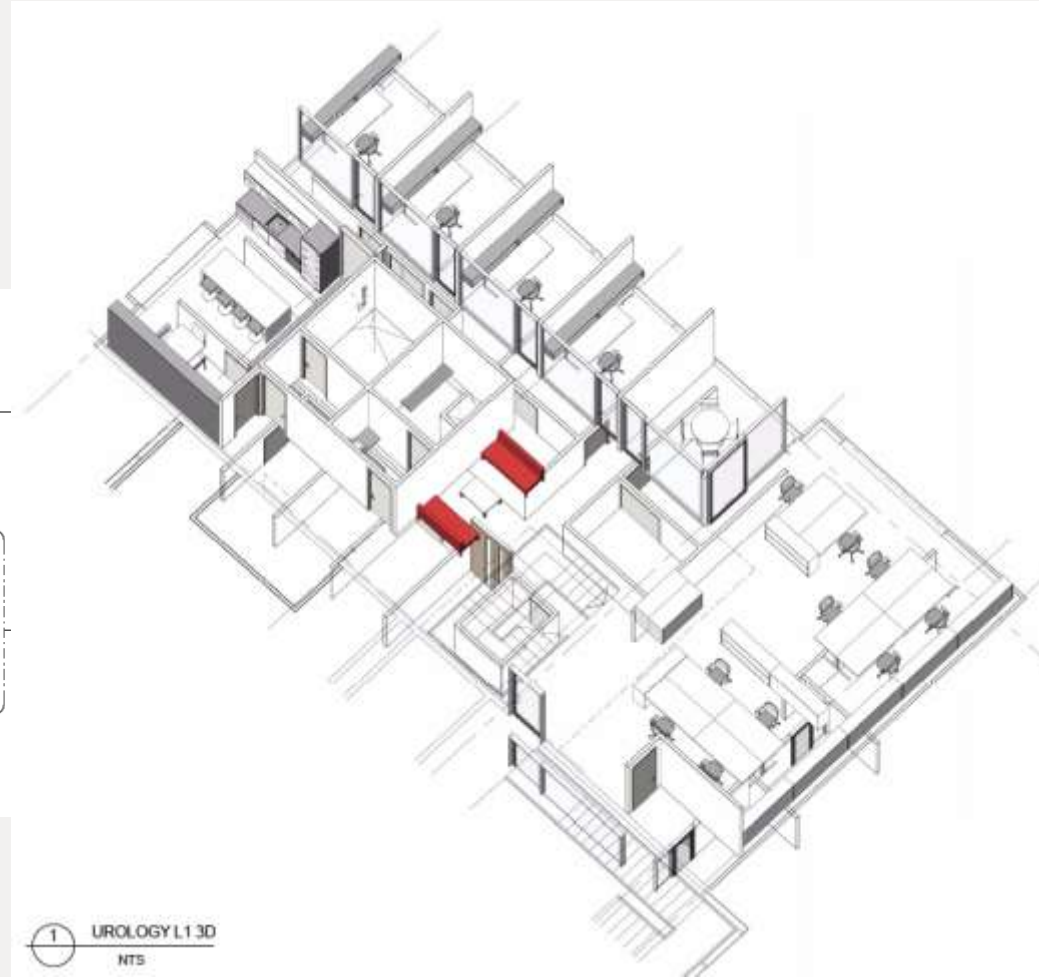
1 MONITECH 3D  
NTS



# BIM Management



1 LEVEL 1 O/A PLAN  
1:200 ©A3



1 UROLOGY L1 3D  
NTS

# BIM Management



Sun view Winter.avi



Overall Sun Movement.avi



Sun view Winter-2.mov



Overall Sun Movement-2.mov



# We form collaborative teams

## KATHLEEN KILGOUR CENTRE

T A U R A N G A R A D I O T H E R A P Y U N I T



CLIENT  
KATHLEEN KILGOUR CENTRE LP

PROJECT MANAGER  
THE BUILDING INTELLIGENCE GROUP

QUANTITY SURVEYING  
RIDER LEVETT BUCKNALL

ARCHITECTURE + INTERIOR DESIGN  
WINGATE + FARQUHAR

CONSTRUCTION  
FLETCHER CONSTRUCTION COMPANY

STRUCTURAL ENGINEERING  
REDCO

SERVICES ENGINEERS  
INNERSCAPE

PHYSICIST CONSULTANT  
RADIATION SERVICES GROUP

FIRE ENGINEER  
BECA

RADIOTHERAPY EQUIPMENT  
ELEKTA

ACOUSTIC ENGINEER  
DESIGN ACOUSTICS

LANDSCAPE ARCHITECTURE  
ISTHMUS  
LIVING URBANISM

TRAFFIC ENGINEER  
TRAFFIC DESIGN GROUP

FACADE CONSULTANT  
MOTT MACDONALD

INDEPENDENT COMMISSIONING SPECIALIST  
PACIFIC CONSULTANTS

GEOTECHNICAL ENGINEER  
TERRANE CONSULTANTS

# Kathleen Kilgour Centre

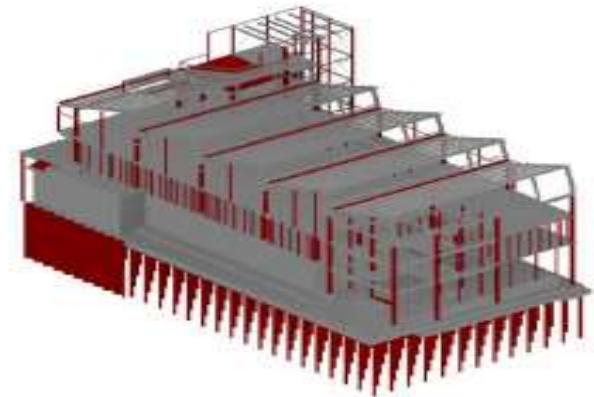


# Kathleen Kilgour Centre

*Architectural Model*



*Structural Model*



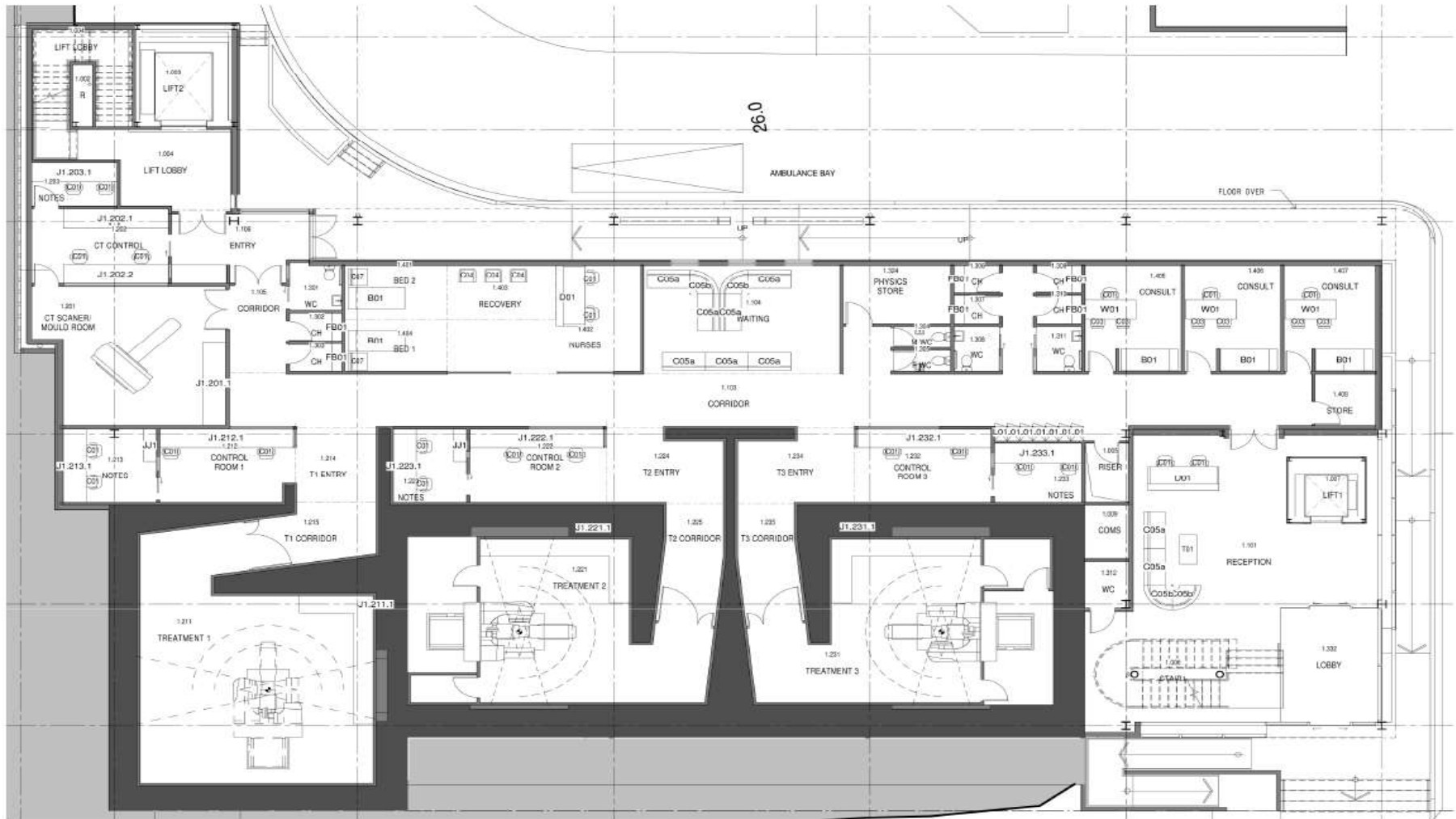
*Interior Model*



*Services Model*



# BIM Management



1.104

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KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT

job no: 11032

issue date: 30.11.12

title/address:

revision: A

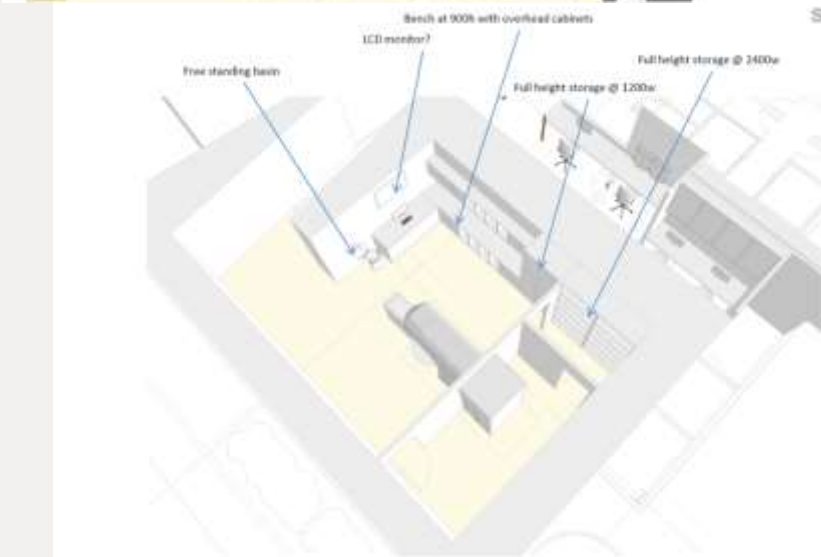
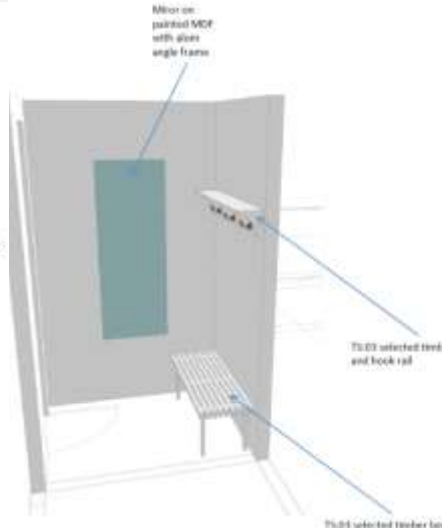
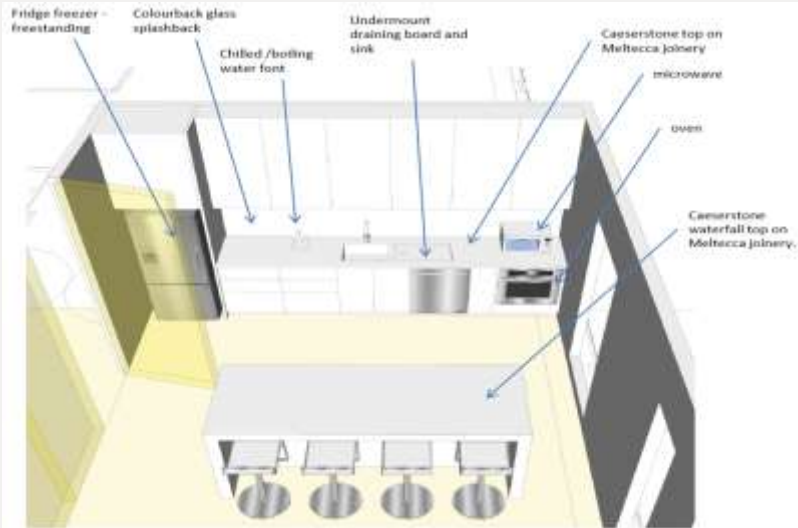
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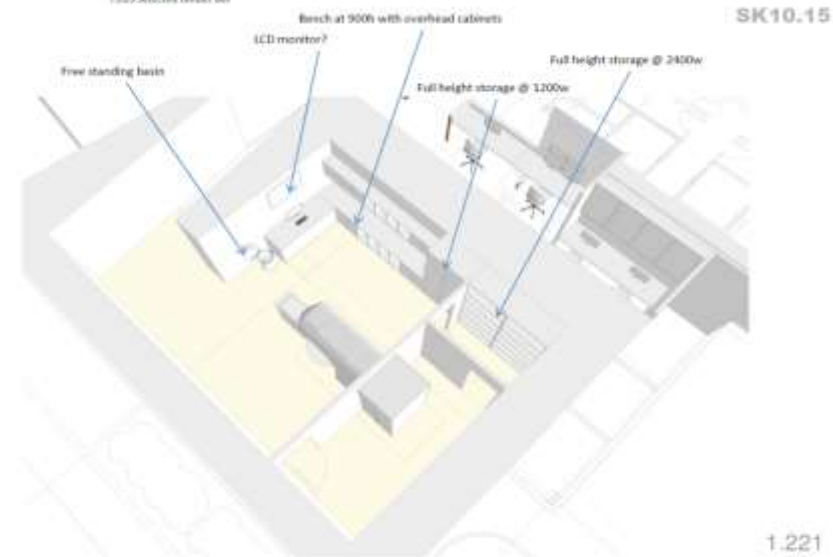
WINGATE  
FARQUHAR



# BIM Management

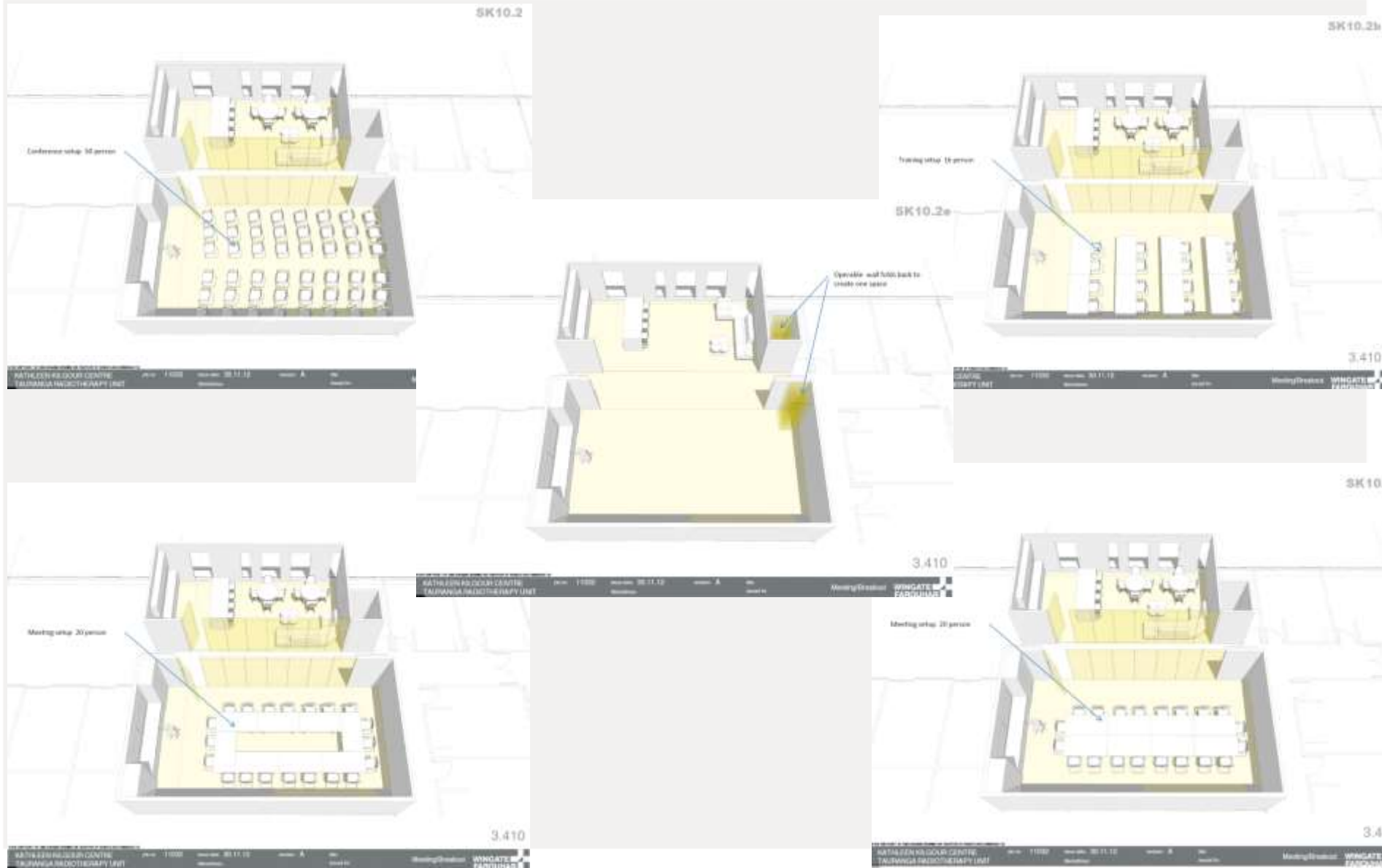


SK10.15  
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1.231



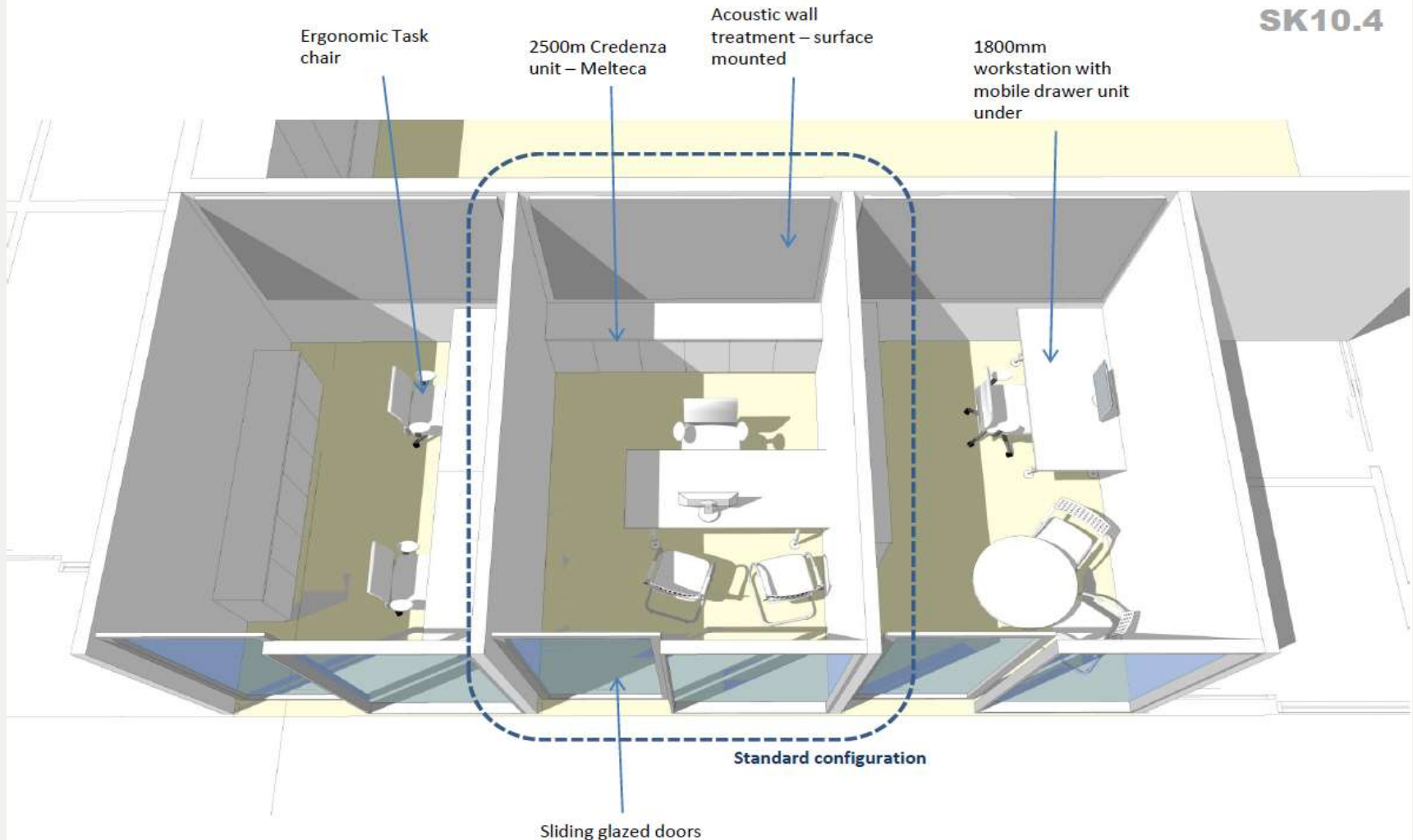
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# BIM Management



# BIM Management

SK10.4



# BIM



THE  
BUILDING  
INTELLIGENCE™  
GROUP



# BIM Management



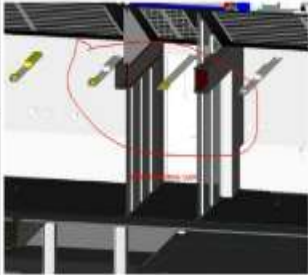
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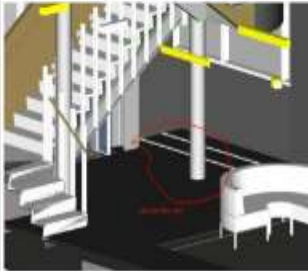
**DATE:** 26 June 2013

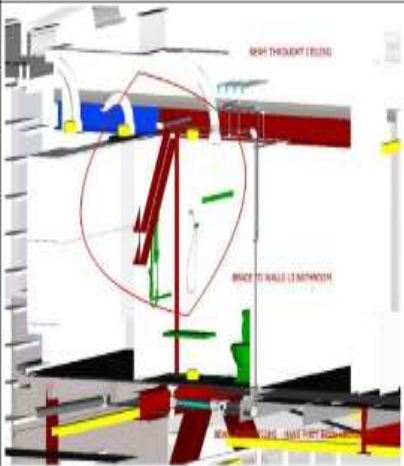
Action Has been done

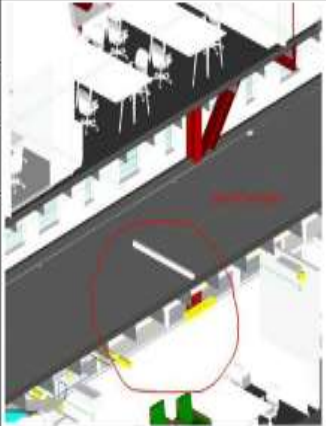
Action is pending

Action is overdue

<b>DATE</b>	13-06-26	<b>VISUAL REFERENCE</b>
<b>ITEM</b>	CR12-01 – CR10 06	
<b>DESCRIPTION</b>	STRUCTURAL WALL POSTS WALL L1	
<b>ACTION</b>	STRUC / ARCH	
<b>COMMENTS</b>	W+f to talk to redo co around beam size al location	

<b>DATE</b>	13-06-26	<b>VISUAL REFERENCE</b>
<b>ITEM</b>	CR12-02 – CR10 03	
<b>DESCRIPTION</b>	ELECTRICAL PIPS TO ATRIUM FLOOR CLASH	
<b>ACTION</b>	STRUC / ELEC	
<b>COMMENTS</b>	to be confirmed on site that is in position as per innerscape instruction	

<b>DATE</b>	13-04-02	<b>VISUAL REFERENCE</b>
<b>ITEM</b>	CR8-02	
<b>DESCRIPTION</b>	STRUCTURAL BRACE CLASH WITH WALL	
<b>ACTION</b>	STRUC / ARCH	
<b>COMMENTS</b>	Can we Please have a look at the positions of the brace and wall location to enclose the structure	

<b>DATE</b>	13-04-02	<b>VISUAL REFERENCE</b>
<b>ITEM</b>	CR8-03	
<b>DESCRIPTION</b>	STRUCTURAL BRACE CLASH WITH WALL	
<b>ACTION</b>	MECH	
<b>COMMENTS</b>	Light fitting on floor _ please remove for next upload	

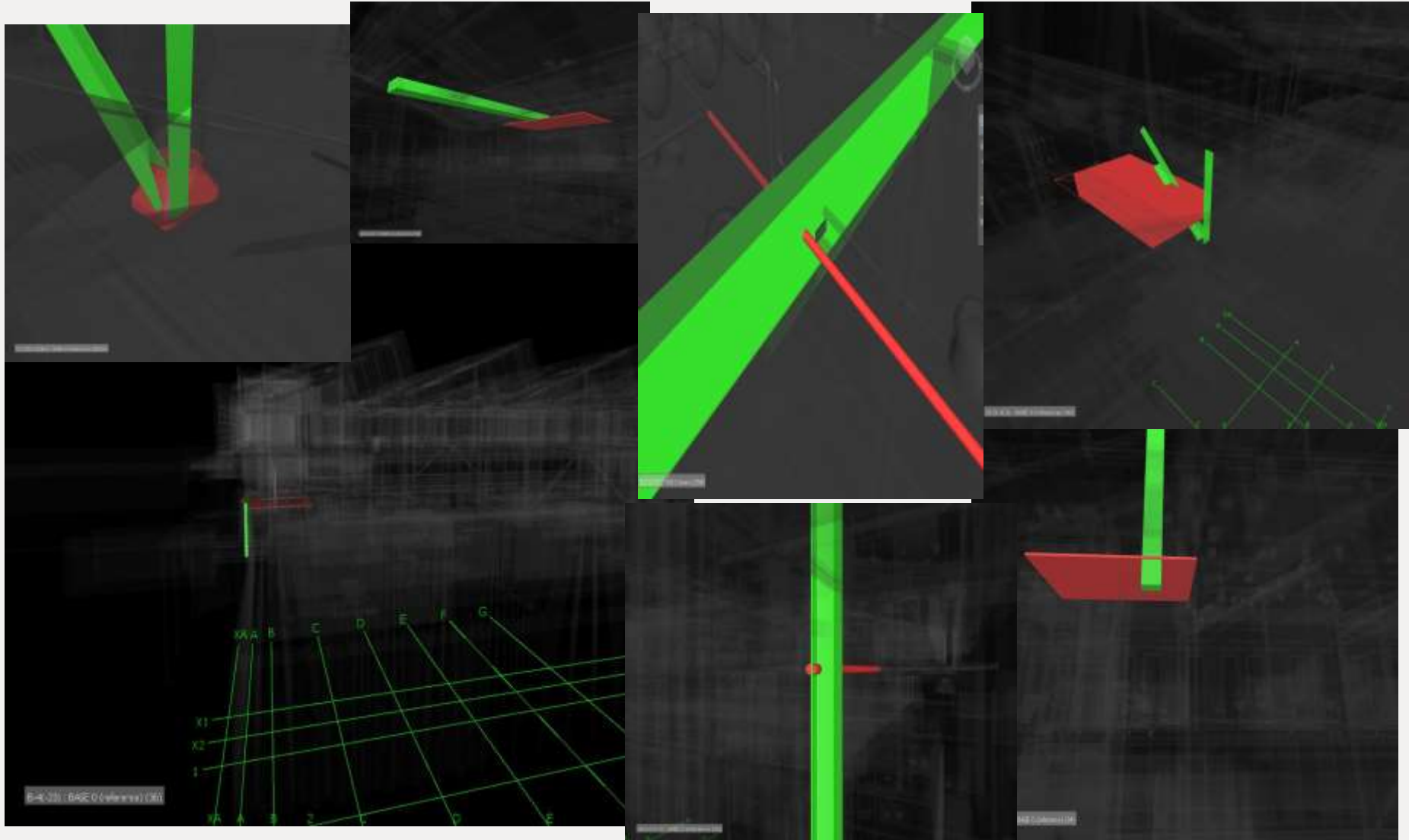
KKC Clash detection  
Critical Clash Detection Matrix  
6th September 2013

	ARCH	ELEC	FIRE	HYDR	MECH	STRUC	Comments
Walls- Partition	-	-	-	-	-	-	
Walls- Curtain Wall	-	-	-	-	-	-	
Doors- Interior	-	-	-	-	-	-	
Doors- Exterior	-	-	-	-	-	-	
Floors- Finish	-	-	-	-	-	-	
Roofs	-	-	-	-	-	-	
Ceilings	-	-	-	-	-	-	
Stairs	-	-	-	-	-	-	
Rampings	-	-	-	-	-	-	
Ramps	-	-	-	-	-	-	
Casework/Joinery	-	-	-	-	-	-	
Specialty Equipment	-	-	-	-	-	-	
Lift Shaft	-	-	-	-	-	-	
Electrical Equipment	-	-	-	-	-	-	
Electrical Fixtures	-	-	-	-	-	-	
Lighting Fixtures	-	-	-	-	-	-	
Electrical Circuits	-	-	-	-	-	-	
Wires	-	-	-	-	-	-	
Telephone Devices	-	-	-	-	-	-	
Nurse Call Devices	-	-	-	-	-	-	
Security Devices	-	-	-	-	-	-	
Communication Devices	-	-	-	-	-	-	
Data Devices	-	-	-	-	-	-	
Lighting Devices	-	-	-	-	-	-	
Switch System	-	-	-	-	-	-	
Fire Alarm Devices	-	-	-	-	-	-	
Plumbing Fixtures	-	-	-	-	-	-	
Piping Systems (Domestic Cold)	-	-	-	-	-	-	
Piping Systems (Domestic Hot)	-	-	-	-	-	-	
Piping Systems (Hydronic supply)	-	-	-	-	-	-	
Piping Systems (Hydronic return)	-	-	-	-	-	-	
Piping Systems (Sanitary)	-	-	-	-	-	-	
Piping Systems (Gas)	-	-	-	-	-	-	
Pipe Fittings	-	-	-	-	-	-	
Flex Pipes	-	-	-	-	-	-	
Pipe Accessories	-	-	-	-	-	-	
Mechanical Equipment	-	-	-	-	-	-	
Ducts	-	-	-	-	-	-	
Duct Fittings	-	-	-	-	-	-	
Air Terminals	-	-	-	-	-	-	
Duct Systems	-	-	-	-	-	-	
Duct Accessories	-	-	-	-	-	-	
Flex Ducts	-	-	-	-	-	-	
Walls- Structural	-	-	-	-	-	-	
Floors- Structural	-	-	-	-	-	-	
Structural Foundations	-	-	-	-	-	-	
Structural Framing- General	-	-	-	-	-	-	
Structural Columns	-	-	-	-	-	-	
Structural Stiffeners	-	-	-	-	-	-	
Lift Shaft	-	-	-	-	-	-	

\*Figures indicate number hard clashes with a 20mm clash overlap or more.  
\*\*Clashes based on Design & Documentation models only (not sub-contractors construction models)

Total clashes: 725

# How we do it



# KKC Case Study

BUILDING INFORMATION MODELLING (BIM) – MEASURING INDIVIDUAL BIM COMPETENCIES OF PARTICIPANTS IN A NEW ZEALAND HEALTH PROJECT 2013

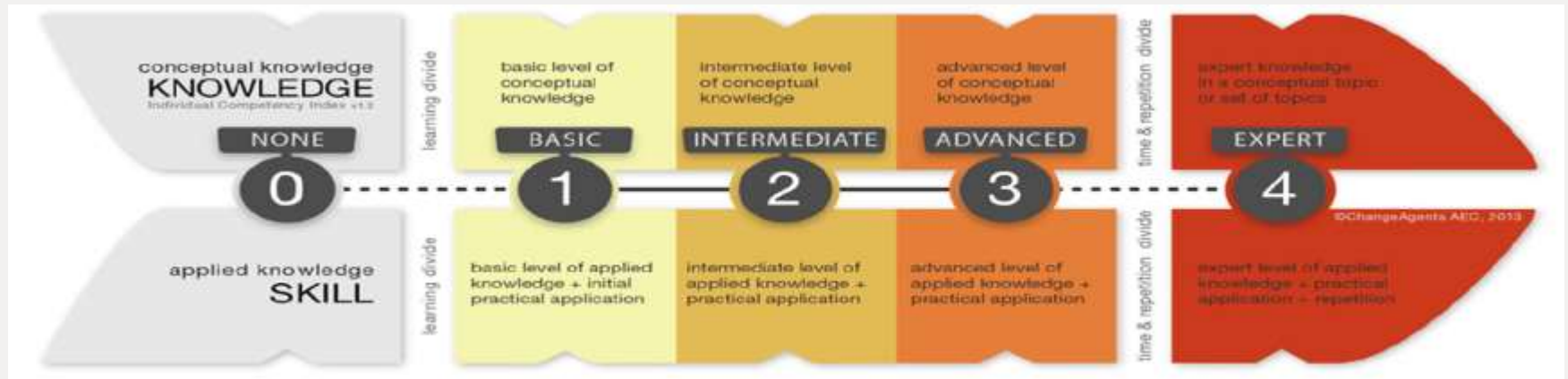
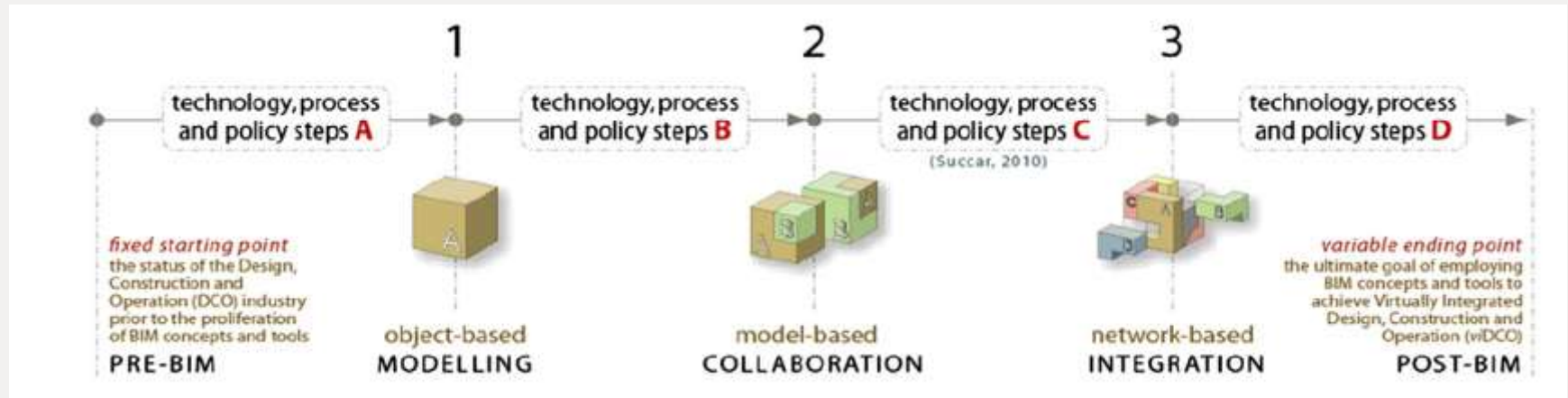
**BIM Google Scholar Search**

<b>Google Scholar Search</b>	<b>McCartney (2010)</b>	<b>Ebbett (2013)</b>	<b>Ebbett (2013)</b>	<b>% Increase</b>
“Building Information Modellin	1700	2,630,000	2,990,000	175,882%
With additional “New Zealand”	57	72,900	137,000	240,350%

Table 2: BIM Google Scholar Search

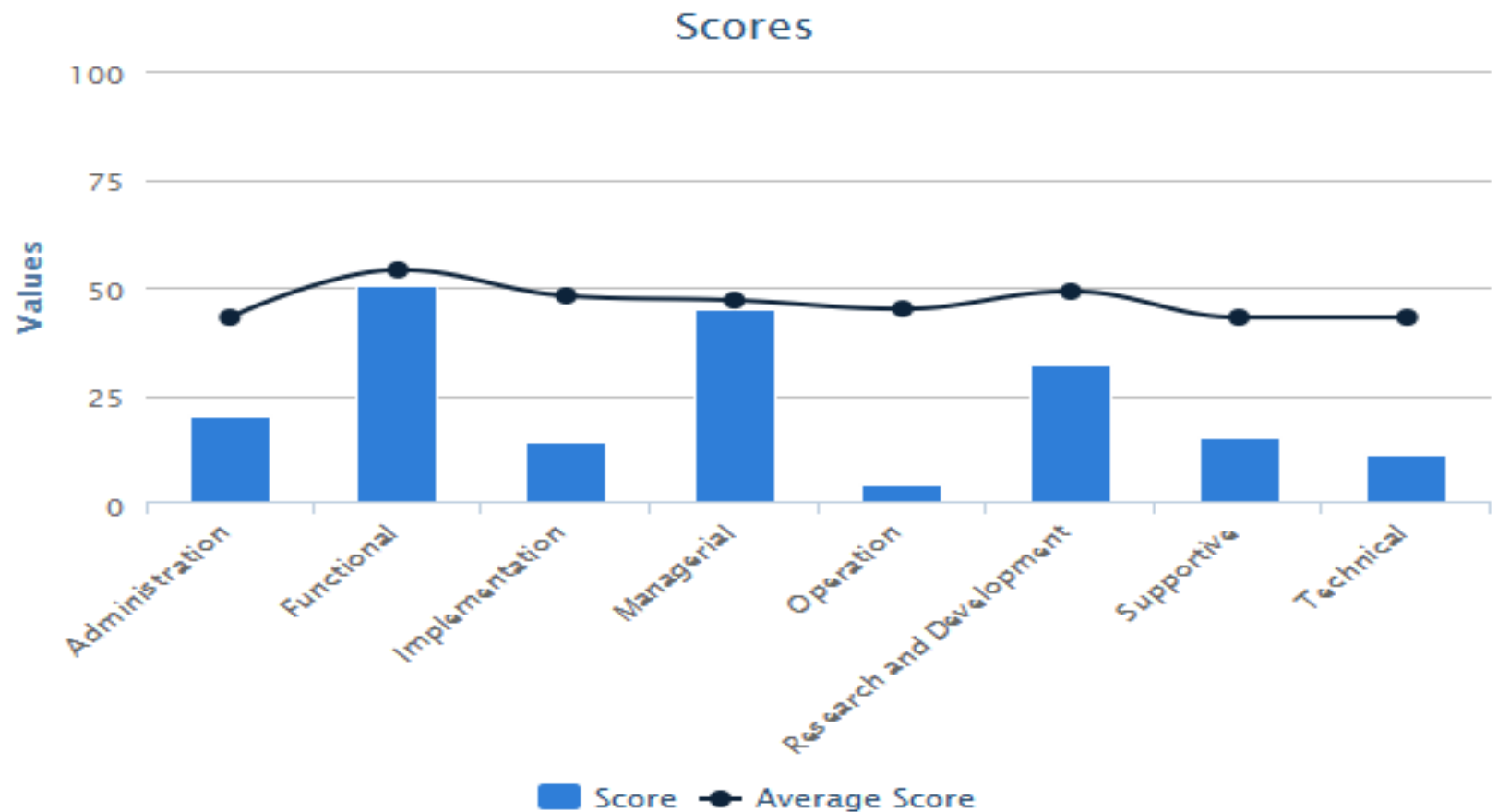


# KKC Case Study

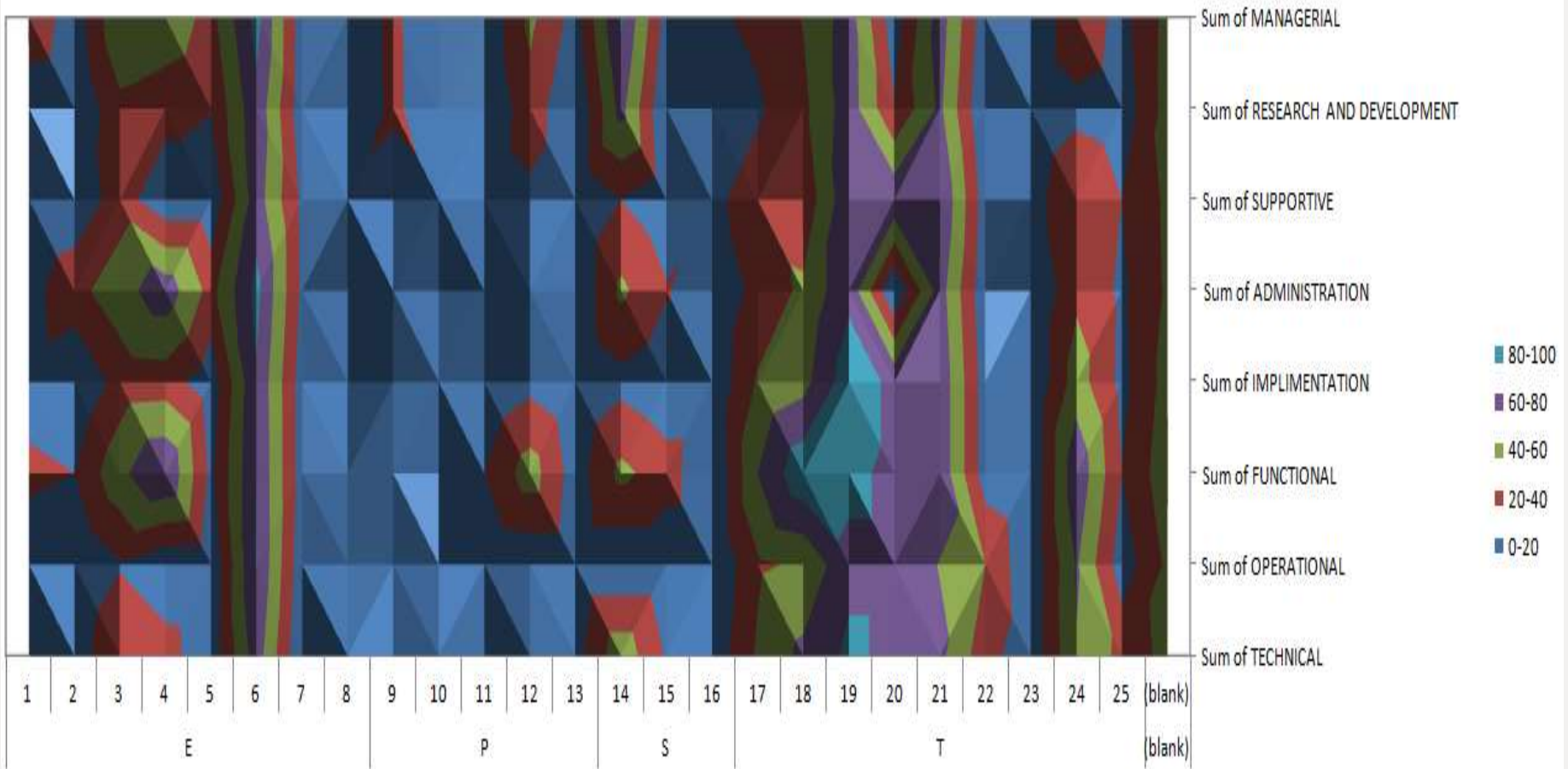


# KKC Case Study

## BIMe Competency Benchmarks



# KKC Case Study





# Next Steps – BIM adoption

## Implemented BIM Lifecycle Deliverables on two New Zealand Commercial Building

### Case Study Projects 2014

BIM Lifecycle Deliverables	Project A	Project B
<b>Design Phase – 3D</b>		
3D – IPD Collaboration* (ECI)	✓ *	✓
3D - Visualisation	✓	✓
3D – Documentation & Specification*	✓ *	✓
3D – Clash detection & Coordinated Design	✓	✓
3D – Energy, Environmental & Structural analysis & validation	✓ *	✓
<b>Construction Phase – 4D</b>		
4D – Location based programming and optioneering	X	✓
4D – Digital site set out	X	✓
4D – 360 Glue & 360 Field – Site Coordination & Productivity	✓ *	✓
4D – 3D Digital Fabrication & Modulisation	✓ *	✓
4D – Onsite real time QA – (IION)	✓ *	✓
4D – Constructors & Subcontractors provide digital O&M's and Models for 6D phase	✓	✓
<b>Cost Planning – 5D</b>		
5D – Optioneering estimates	X	✓
<b>Facilities Management &amp; Operations - 6D</b>		
6D – BIM enabled CAFM (YouBIM)	✓	✓

# Why it matters

- De-risked Feasibility, Design & Construction phases delivered at the same cost as traditional methods.
- After the facility delivery phase – We can deliver intuitive BIM tools for facilities management for our clients to reduce the all important but often forgotten Operating Expenses.

# Why it matters – Asset Lifecycle

- We use tools such as YouBIM to deliver efficiencies in our clients operating expenditure:
  - Navigation
  - Work orders
  - Scheduled Maintenance
  - Searching
  - Integration with CMMS / CAFM
  - Integration with Building Management System
  - Object Data
  - Attached Operations and Maintenance Manuals
  - Visual Adjustments



**BIM for Facility Management - YouBIM - Cloud based solution.mp4**

# BIM Benefits

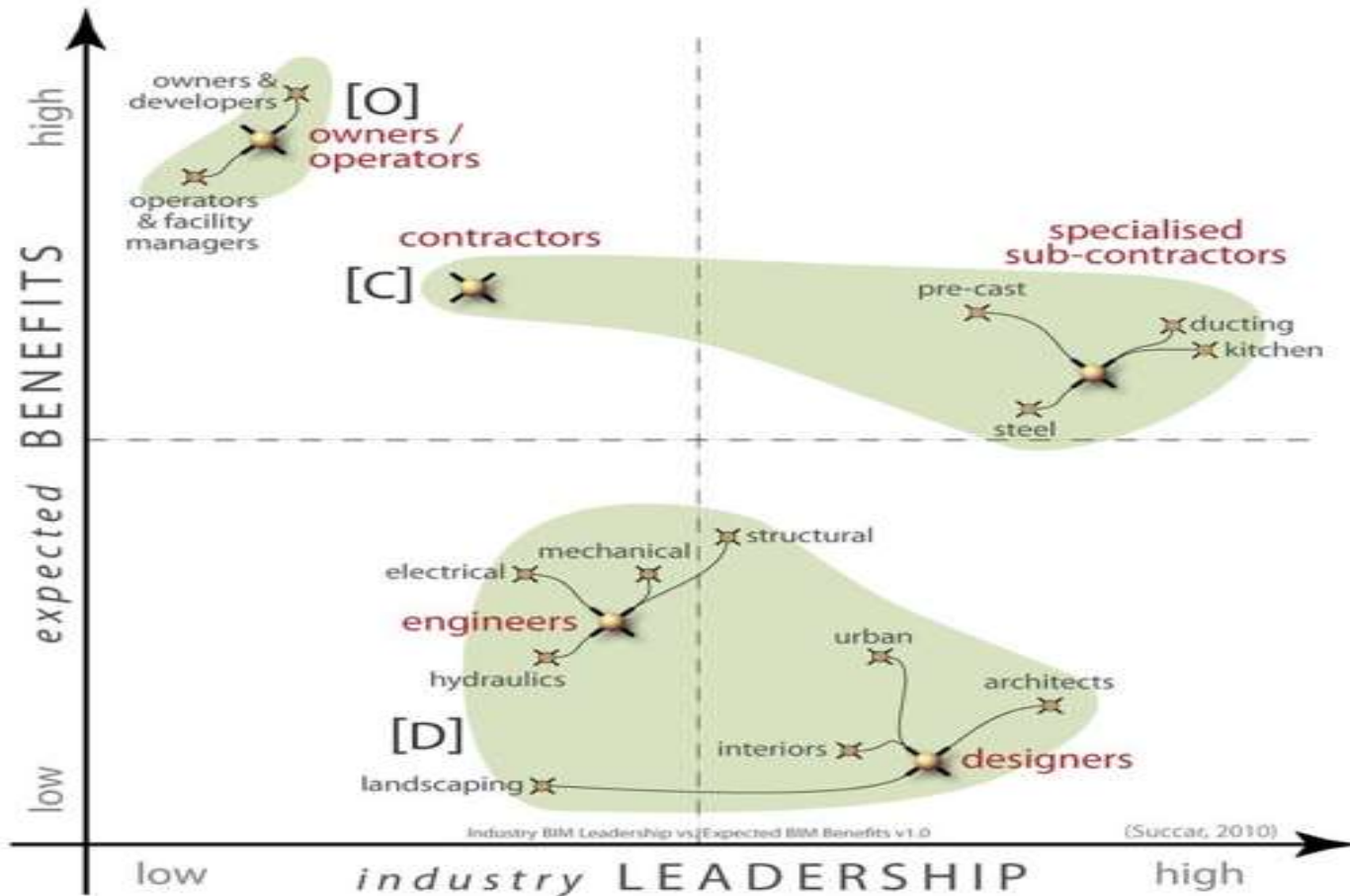
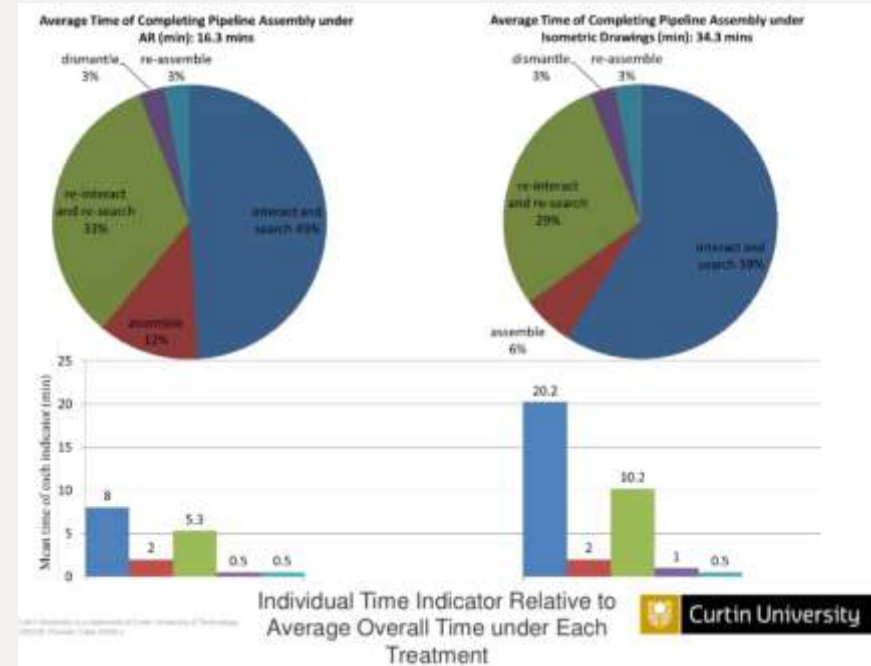


Figure 1. Industry BIM Leadership vs. Expected BIM Benefits v1.0

# BIM Benefits

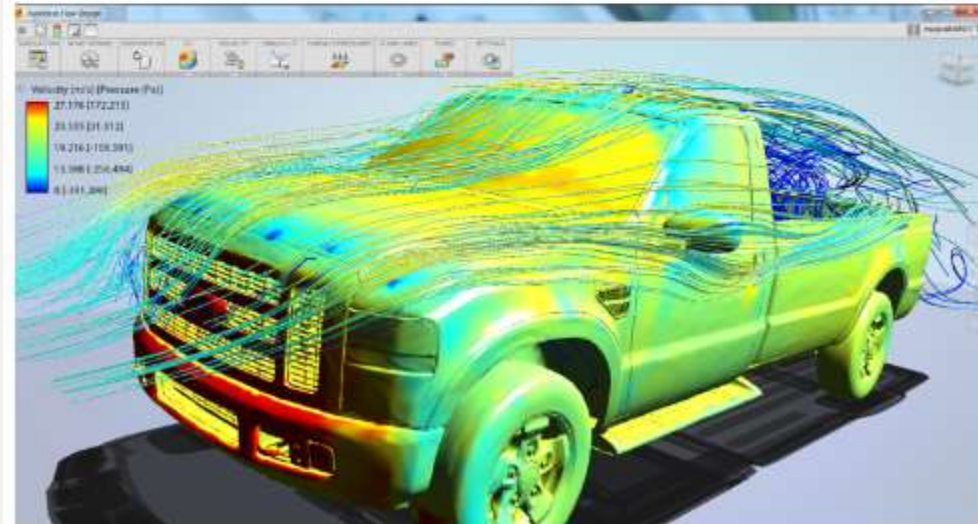
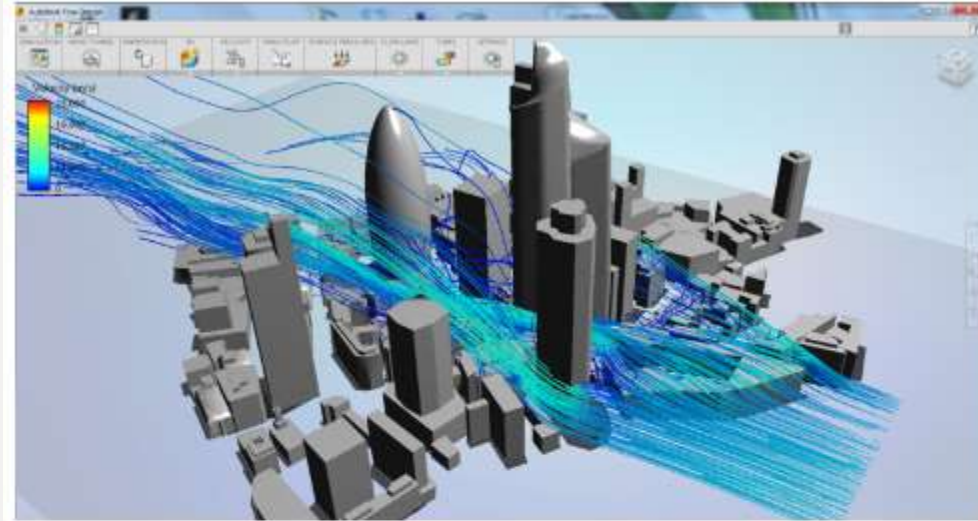
New Frontier technologies are paving the way...

- 3D Printing & fabrication – Printing concrete houses in the US
  - Building, Medical, Food, ++++
  - The Future we will **Transmit not Transport** goods
- 3D point cloud scanning
- Augmented Reality
  - <http://www.youtube.com/watch?v=rdUIjGIVBY8>
- Green – Simulation & Testing
- Lean – Continuous improvement & Commissioning (Building Management Systems)



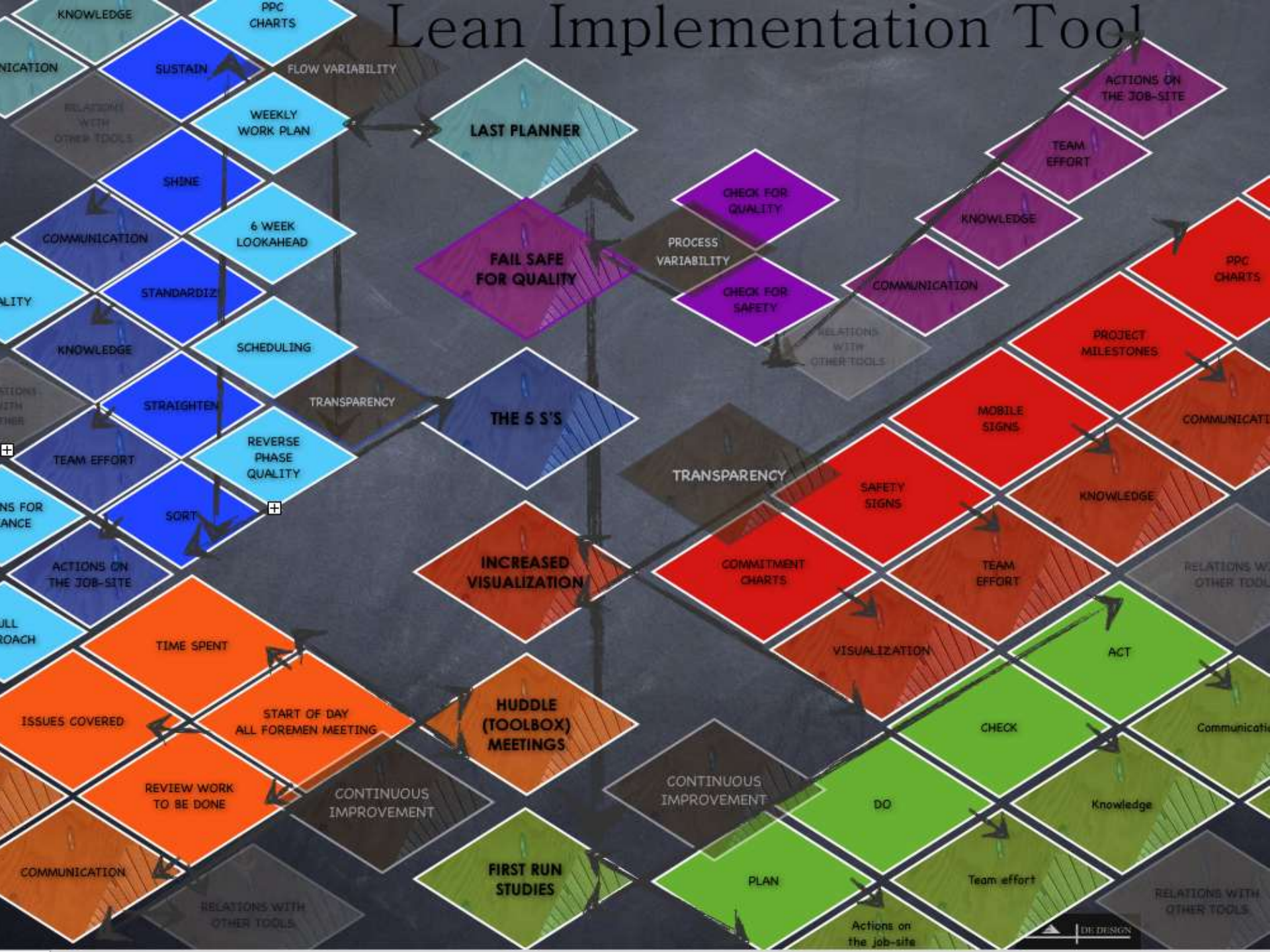
# BIM Benefits

- Safety – Robotics, Trend of military & mining now using drones
- AI – Sensors, i.e. Self Driving Cars, Sensor in the concrete truck example
- BIG Data – Cameras & Surveillance everywhere, Retail data collection
- Youth Trends – Connected, Social, intuitive
- GIS – Geobuild [GeoBuild™](#) – [National Consenting - Tauranga City Council](#)





# Lean Implementation Tool

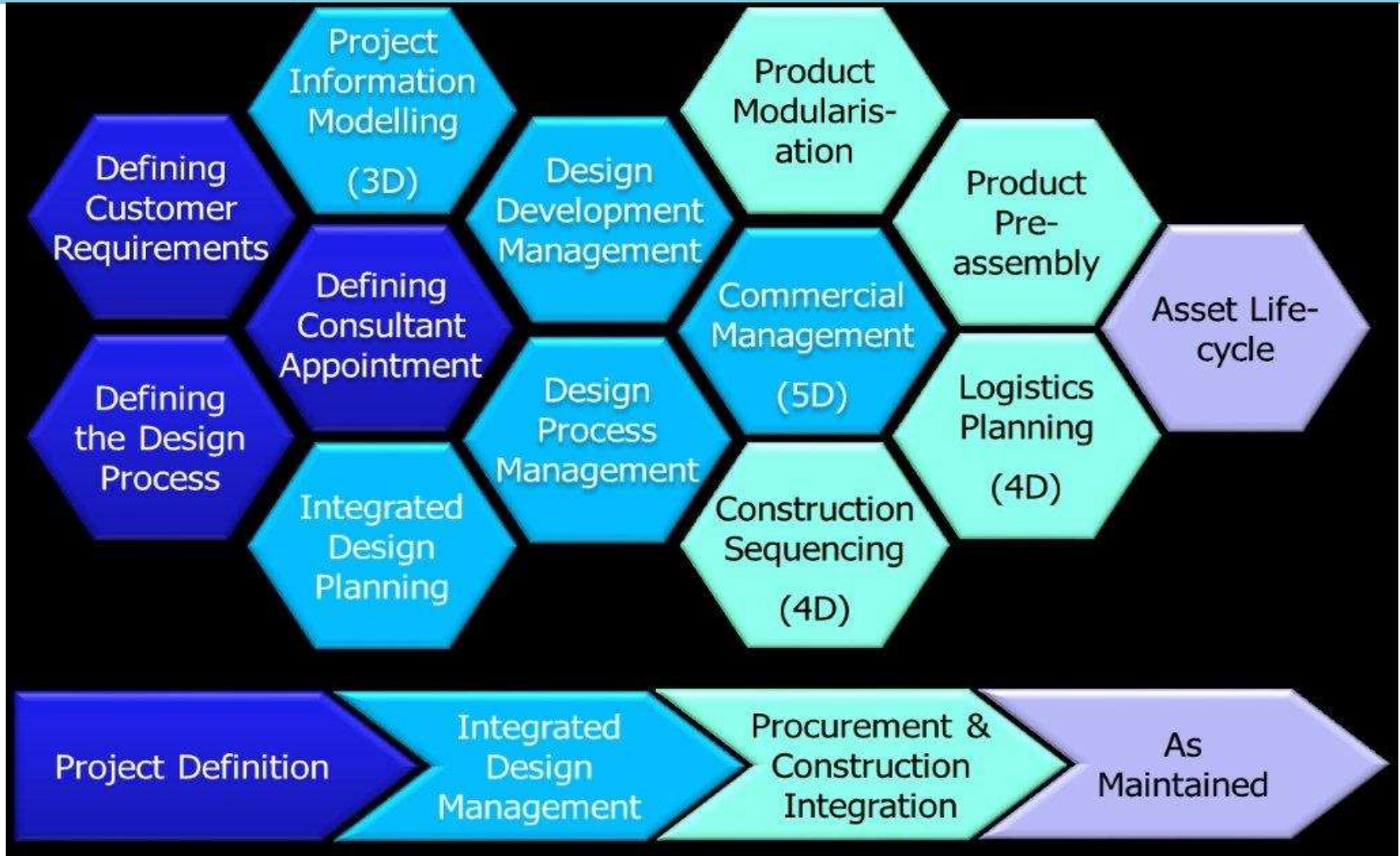




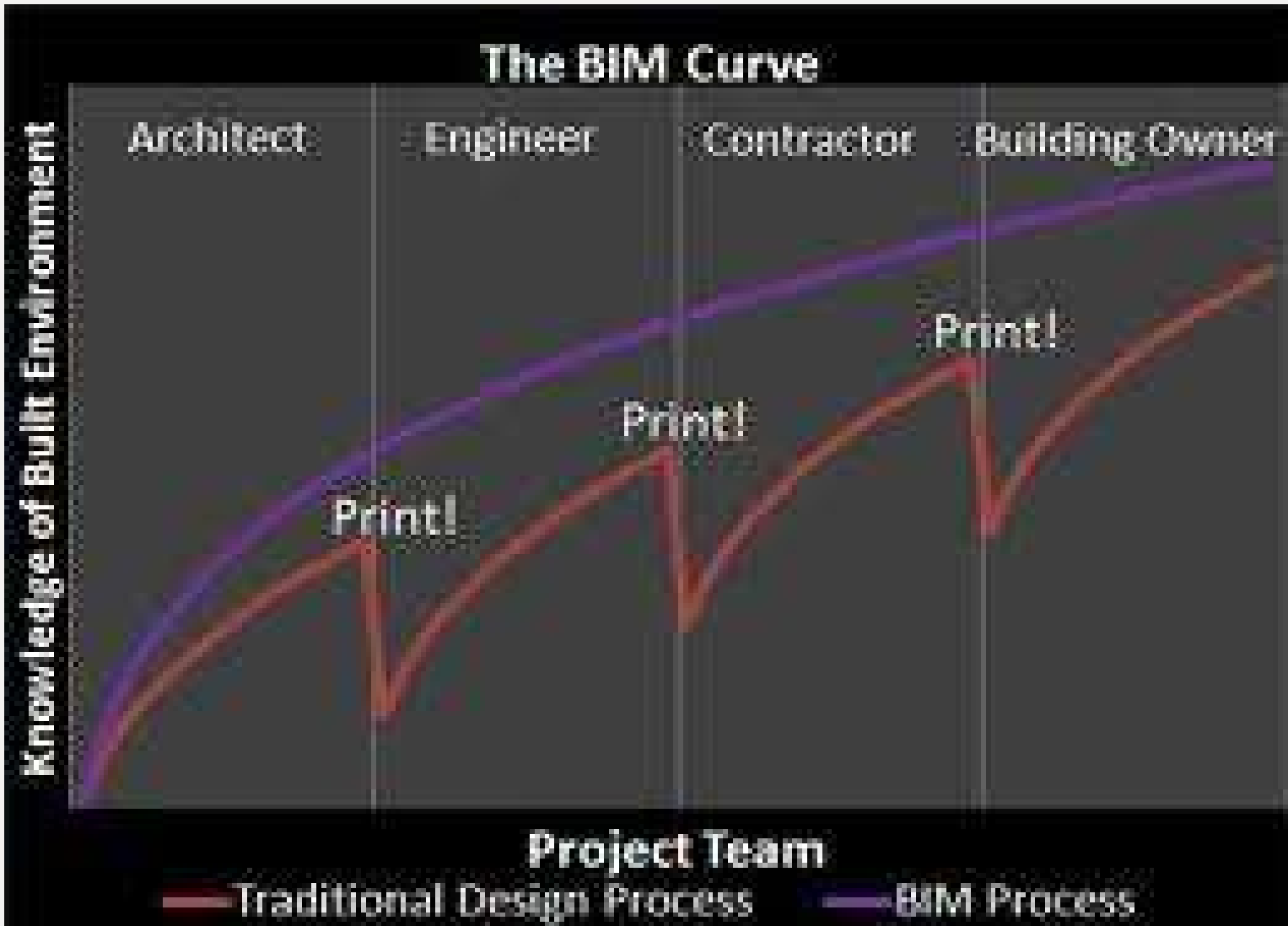
# BIM Risks

- Unskilled & Ill-experienced design team (competitive financial based consultant tender process + BIM Wash)
- BIM deliverables not defined upfront (Outputs are reflective of planned Inputs)
- BIM Process not managed effectively (Extended bell curve)
- Supply chain not engaged early (lost added value)
- Supply chain don't understand procurement & IPD methods
- Traditional Procurement & Contractual methods (Early days)
- Legal, Liability & Intellectual Property issues
- NZ SME syndrome

# How it works



# Why it matters - Information



# Why it matters - Productivity



# Communication – The Box (Cloud)

Admin Console My Account

THE BUILDING INTELLIGENCE™ GROUP Search Files Dave Ebbett

## Recent updates: All

< 2 of 3 >

Alison previewed: ... > KKC Client Communications folder > KKCLP Client Approval folder · Oct 29, 2013 at 9:52 AM

**BOB Times TBIG Ad - Client Approval.pdf** Share

Created Oct 27, 2013 by Dave Ebbett · 814.5 KB · 3 · 2

Comment · Assign Task · Unlike You and Peter Gilling like this · 2 · 1

**Dave Ebbett** Oct 27, 2013 at 12:14 PM  
Mark & Peter both signed off

**To Update:** Task Complete. Due Oct 29, 2013 · 1 of 1

**gaye domanski** Oct 31, 2013 at 08:44 AM · Completed  
Noted thanks. Will send artwork to BOP times

Enter a comment or assign a task

**Ad for Bay of Plenty Times feature.pdf** Share

Created Oct 25, 2013 by Dave Ebbett · 34.8 KB · 3

Comment · Assign Task · Like 1

**Dave Ebbett** Oct 25, 2013 at 12:10 PM  
Hi Mark & Peter - With the mid-November BOP Times KKC Construction Feature article approaching, can you please comment and or approve on the attached TBIG advert.

**To Approve:** Task Complete. Due Oct 30, 2013 · 1 of 1

**Peter Gilling** Oct 25, 2013 at 05:19 PM · Approved  
Looks good Dave

Enter a comment or assign a task

### @tbig.co.nz Colleagues

- gaye domanski Invite to a folder
- Brent Thomson Invite to a folder
- Graeme Cocks Invite to a folder
- 2 More Colleagues

### Updates Options

- Edit email notification settings

### Resources

- Help
- Success And Training Corner
- Box Community



# Q & A.