

# **BIM Management Services**

## **Life-Cycle BIM**

**THE  
BUILDING  
INTELLIGENCE™  
GROUP**

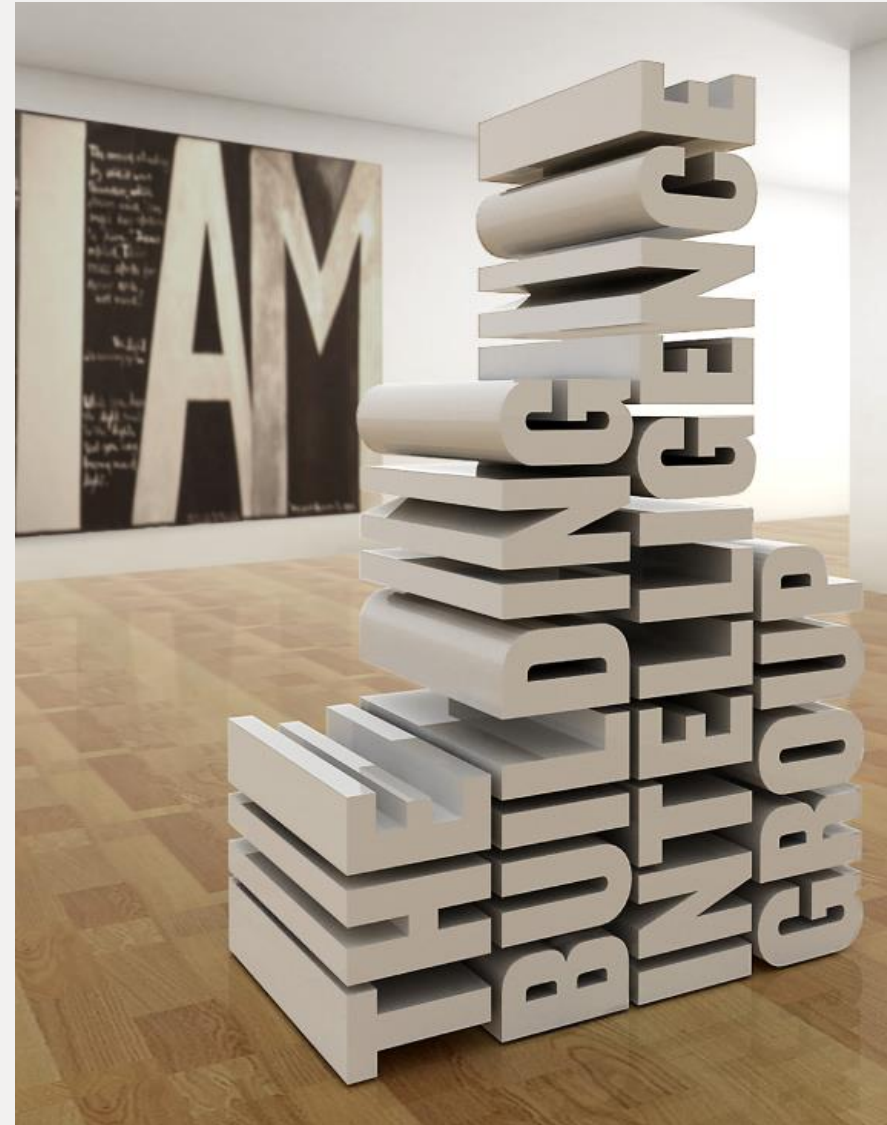
# Contents

- 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.



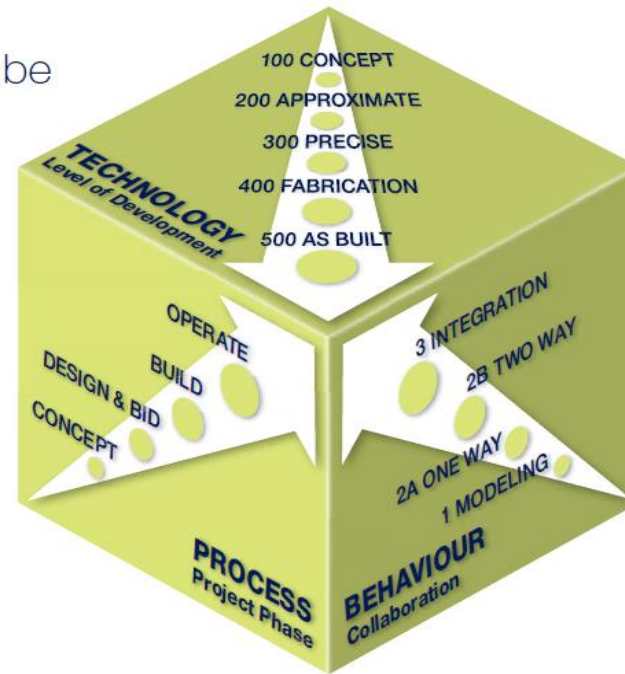
# Dave Ebbett

Introducing:

Dave Ebbett  
Project Manager



BEP Cube



**Modelling Information**  
shaping  
forming  
presenting,  
scoping  
an organised  
set of data:  
meaningful,  
actionable

to virtually construct a  
to extend the analysis of a  
to explore the possibilities of  
to study what-if scenarios for a  
to detect possible collisions within a  
to calculate construction costs of  
to analyse constructability of a  
to plan the deconstruction of a  
to manage and maintain a

**Building**  
a structure, an  
enclosed space,  
a constructed  
environment  
(Staccor, 2008)

Fig. 2. Some common connotations of multiple BIM terms.

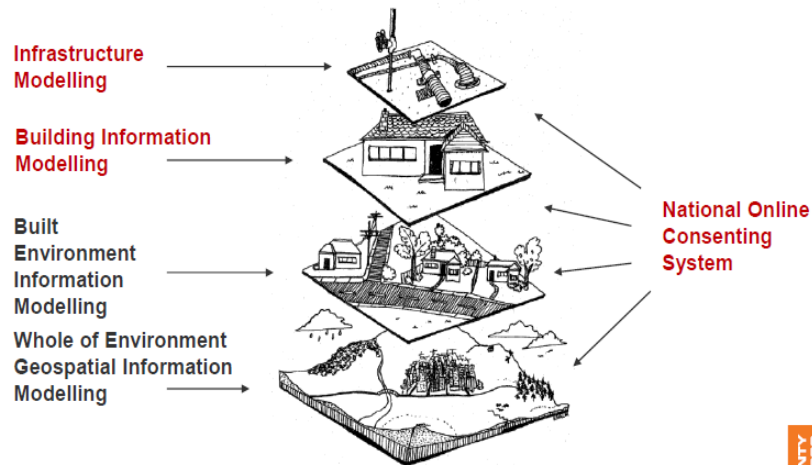
# Dave Ebbett



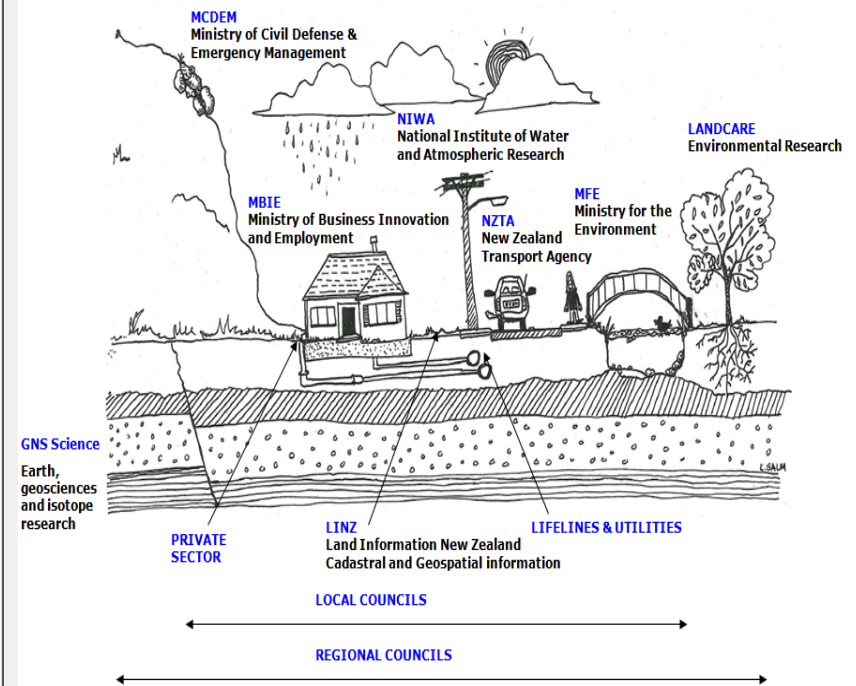
# Productivity Partnership

- BIM Handbook
- NZ BIM Schedule

## The long game

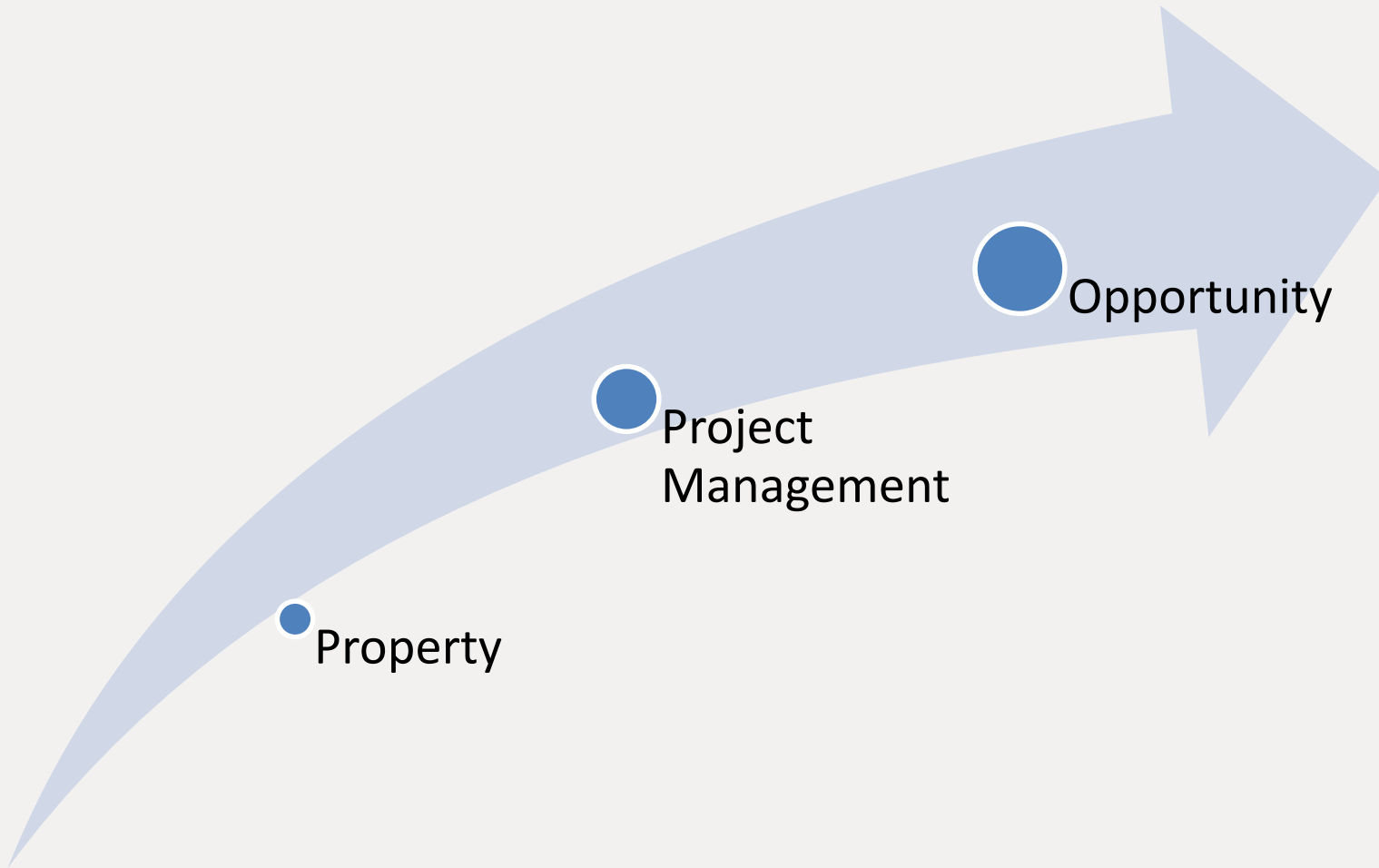


## GeoBuild™ – an Interoperable Whole Environment Information Model

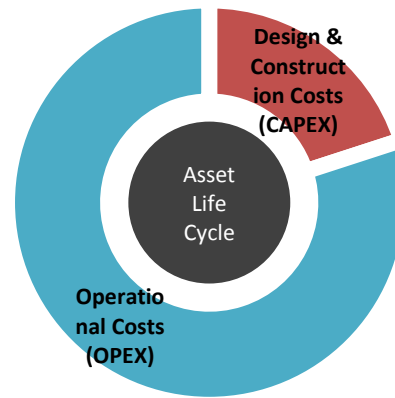


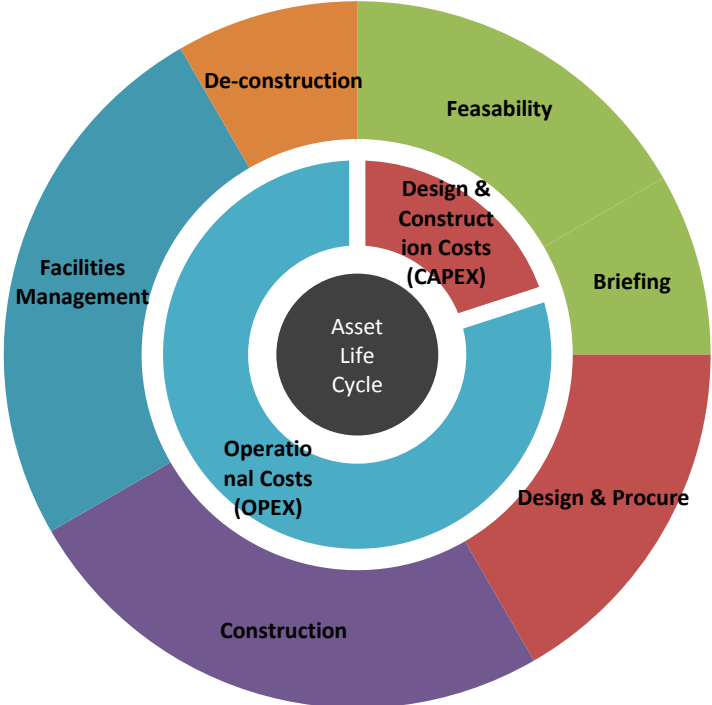


# Asset Life Cycle

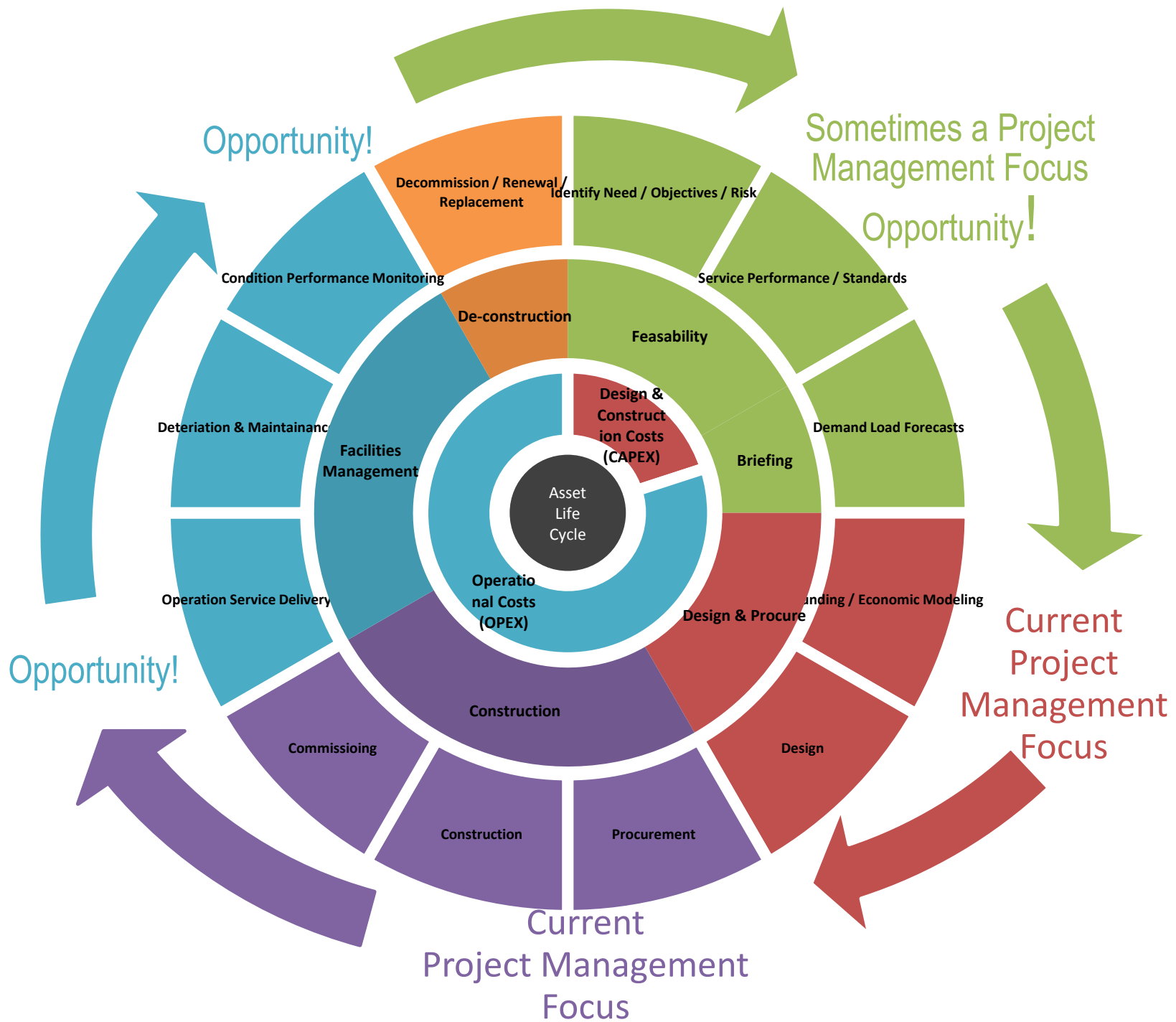


Asset  
Life  
Cycle







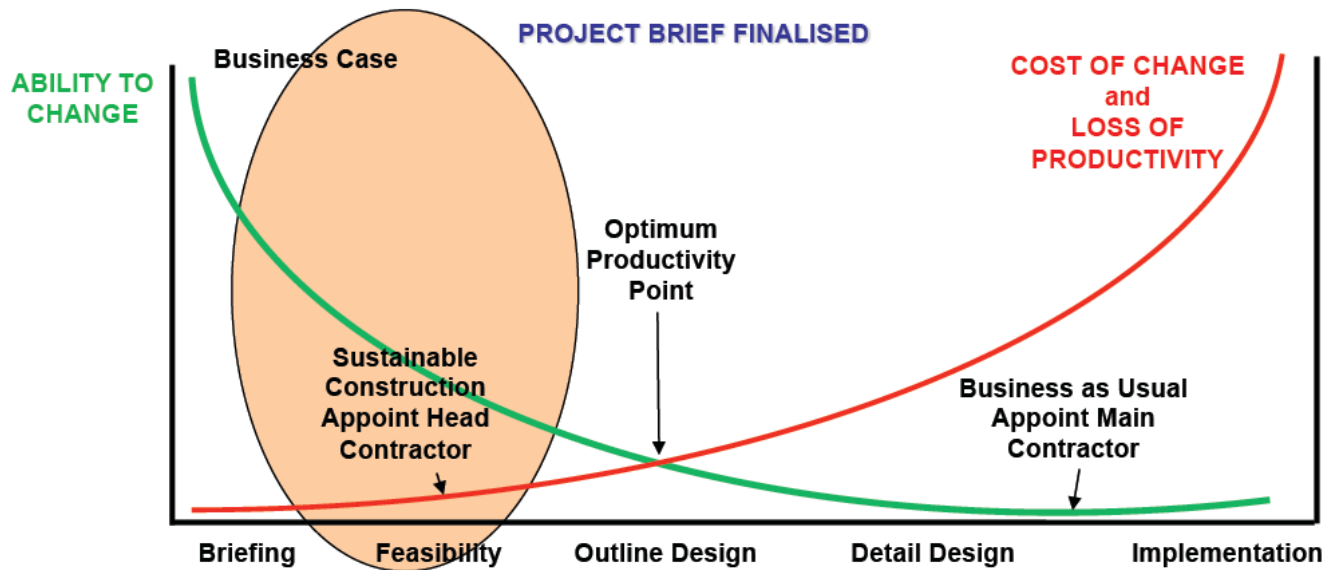


# Why it matters

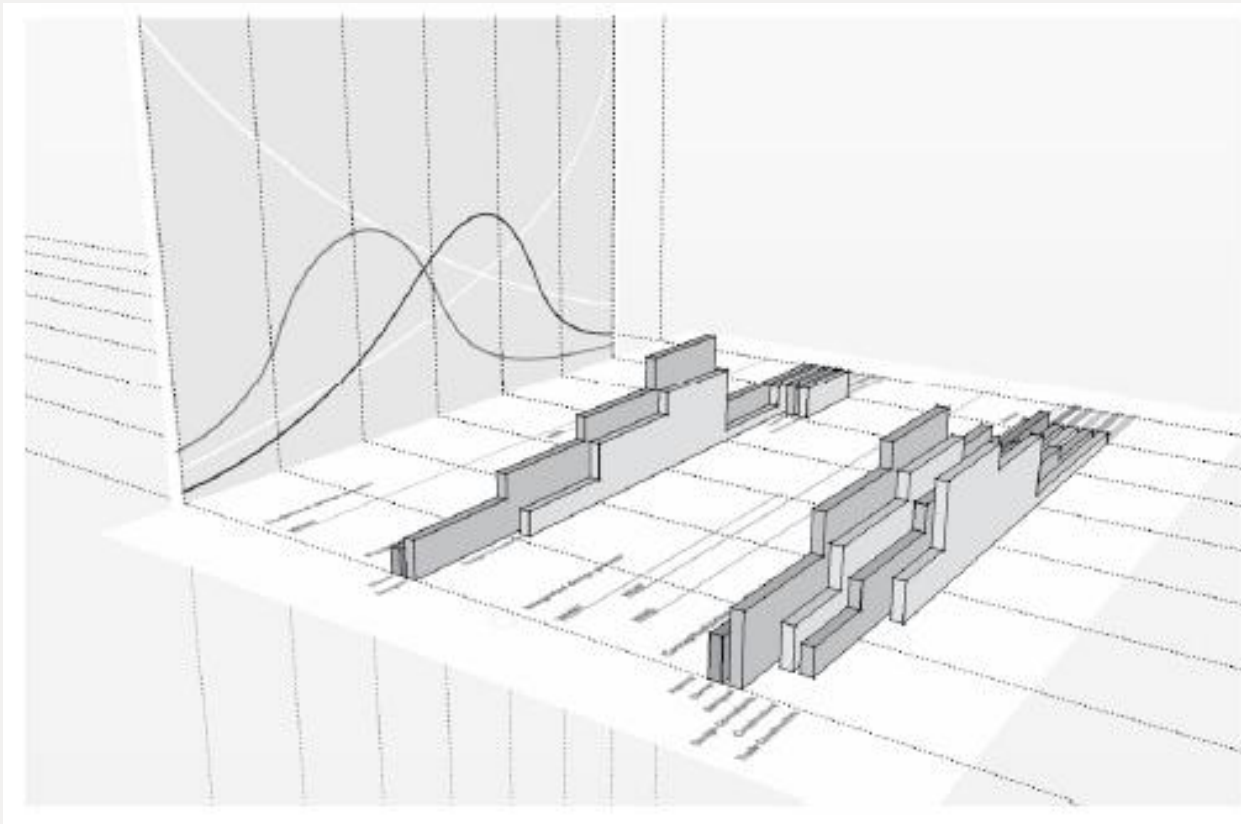
TWENTY BY 2020

## APPOINTMENT OF INTEGRATED PROJECT DELIVERY TEAM

UNLOCKING VALUE ADDED BENEFITS AND MAXIMISING PRODUCTIVITY

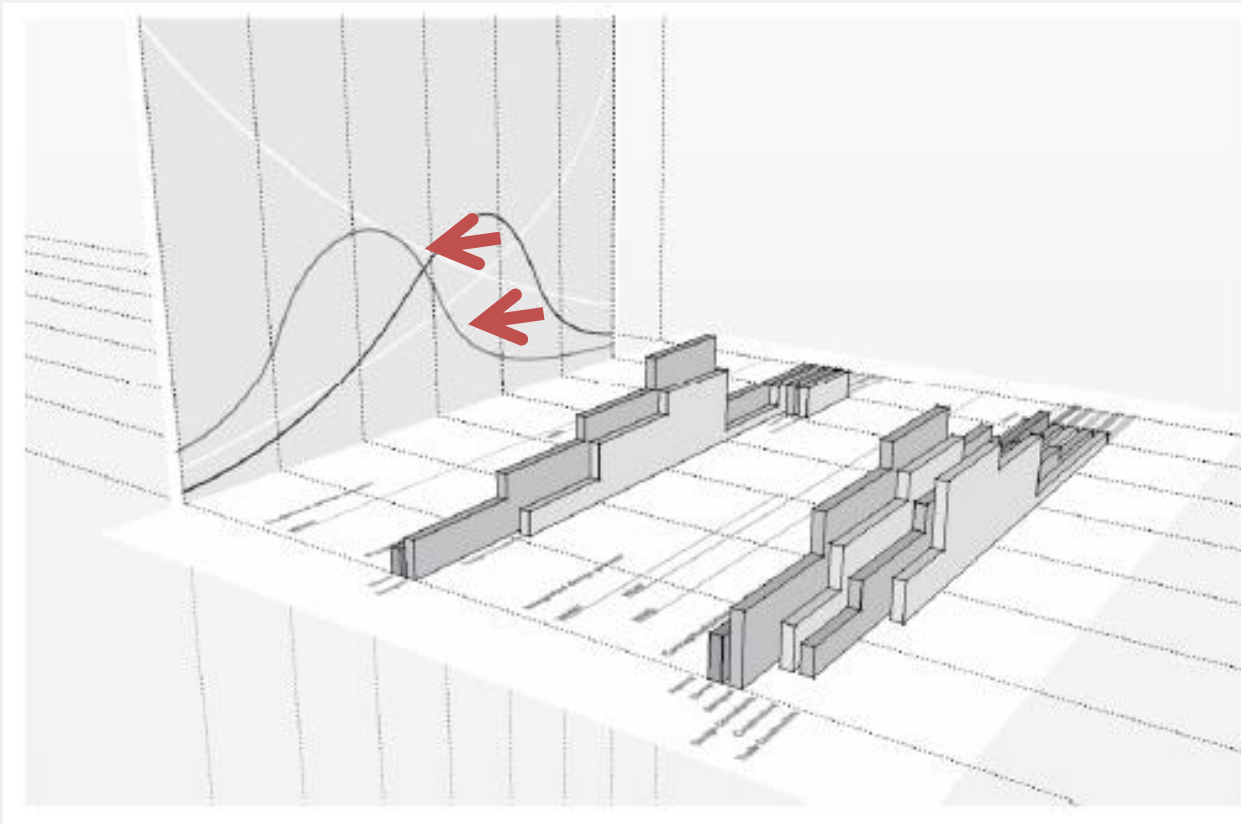


# Why it matters – Lessons Learnt

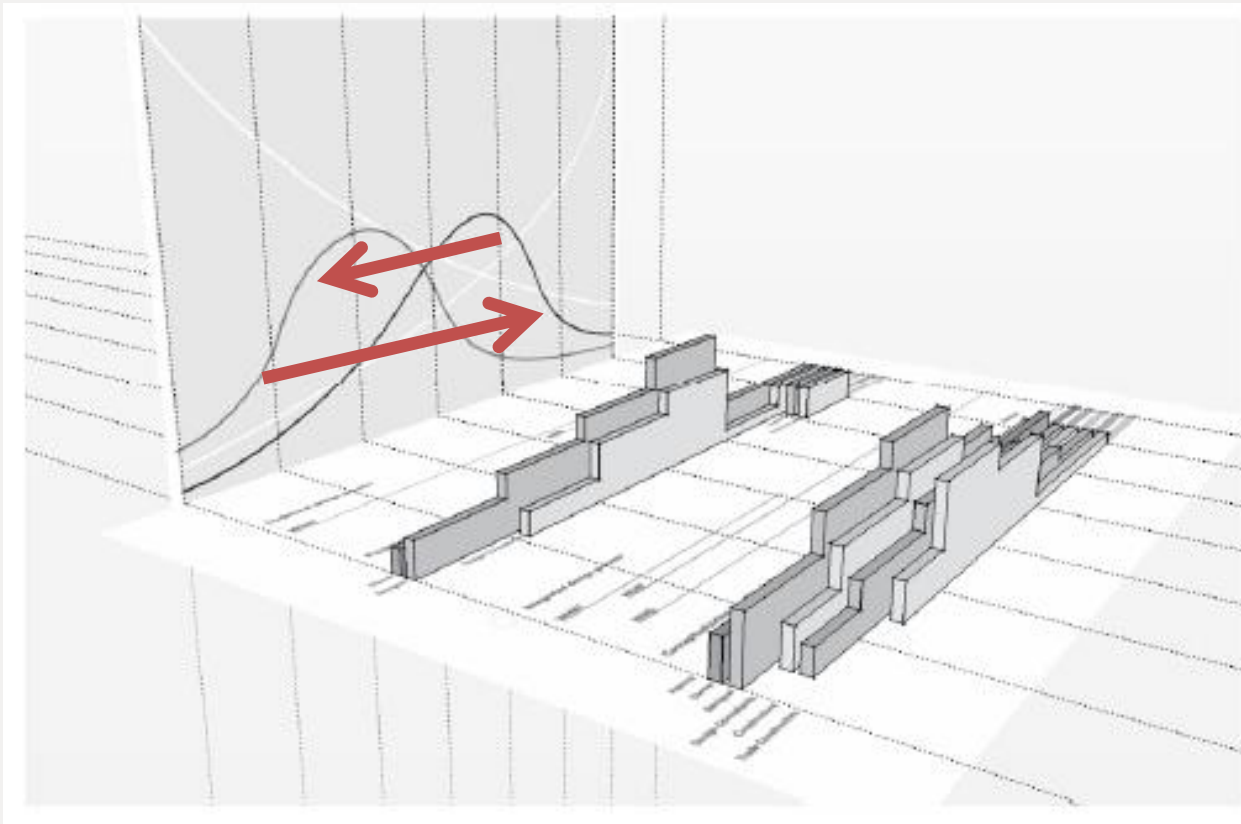




# Why it matters – Lessons Learnt



# 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

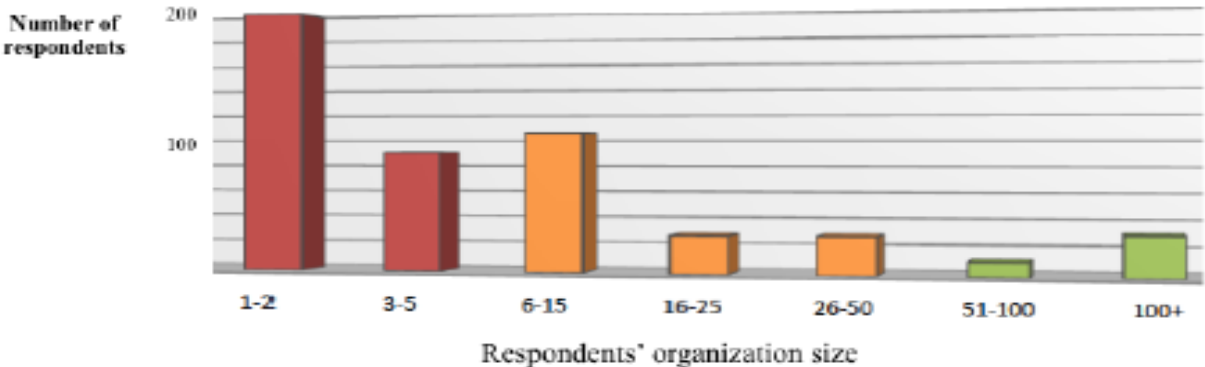
Digitally based, virtual  
building Information modelling  
3, 4, 5, & 6 Dimensional

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

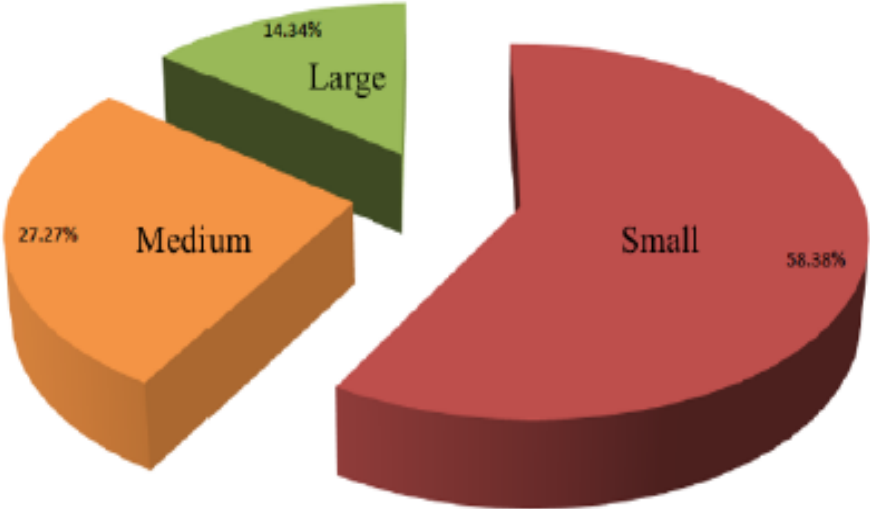
1-2	3-5	6-15	16-25	26-50	51-100	100+
198	91	106	29	29	11	31

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

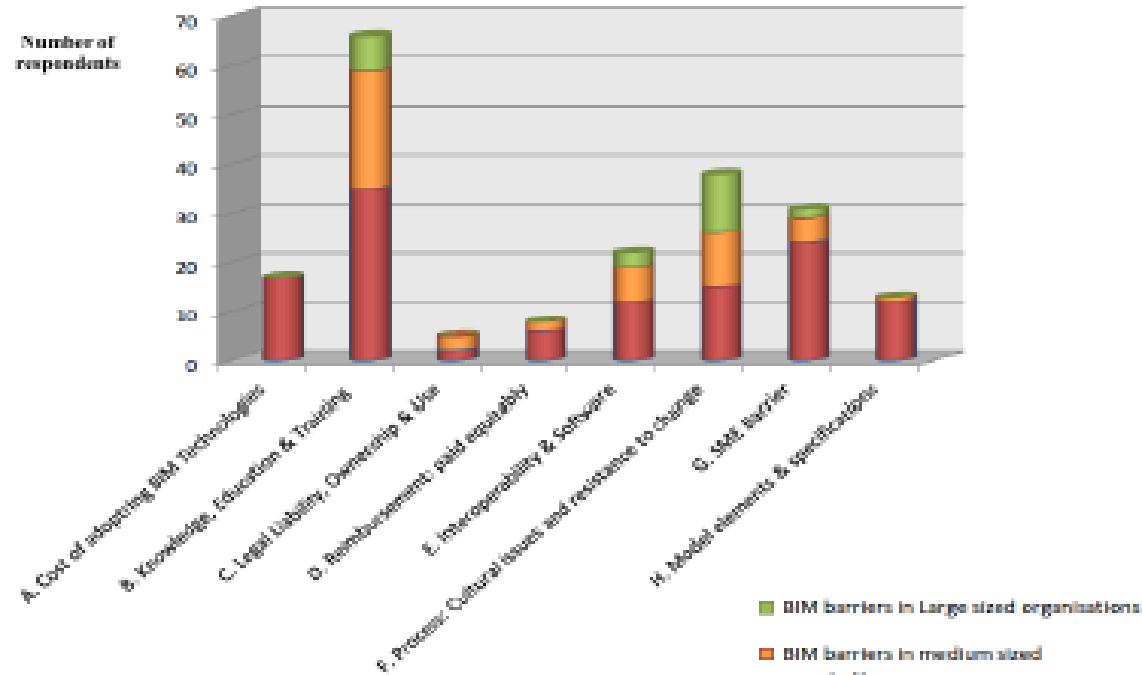


Figure 28. End of survey - (Open ended question: any other comments): BIM barrier responses

# 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

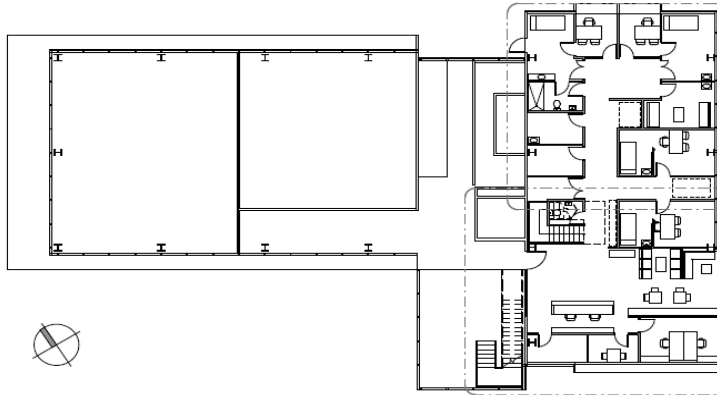


Permitted Baseline for Development – 9m

# BIM Management



# BIM Management

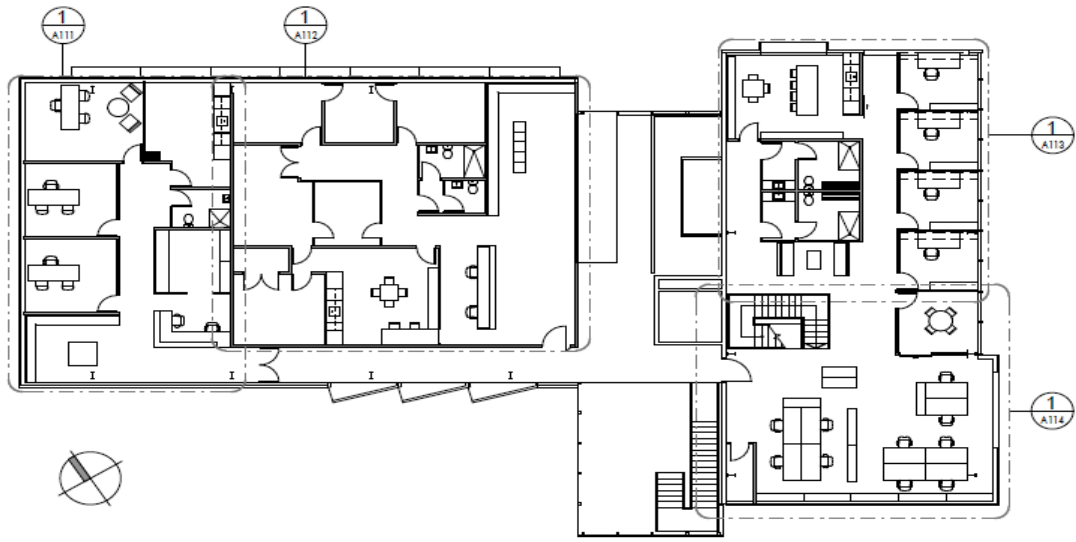


1 GROUND FLOOR O/A PLAN  
1:200 @A3

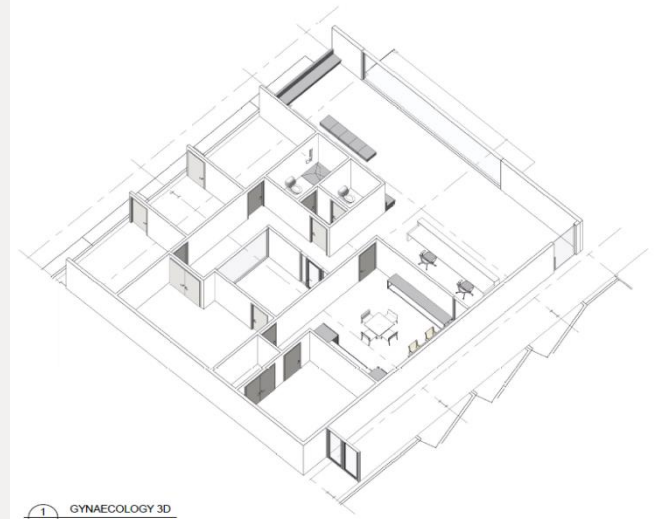


1 UROLOGY GL 3D  
NTS

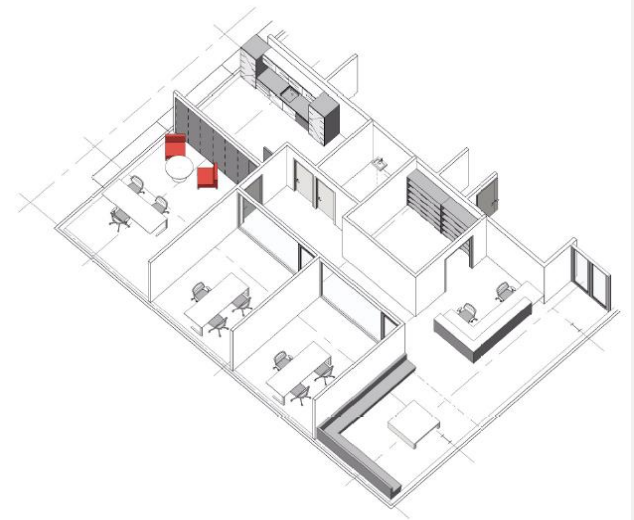
# BIM Management



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

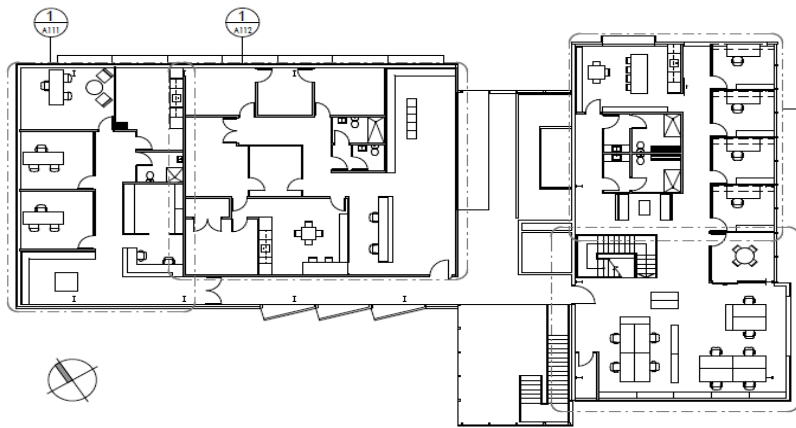


1 GYNAECOLOGY 3D  
NTS

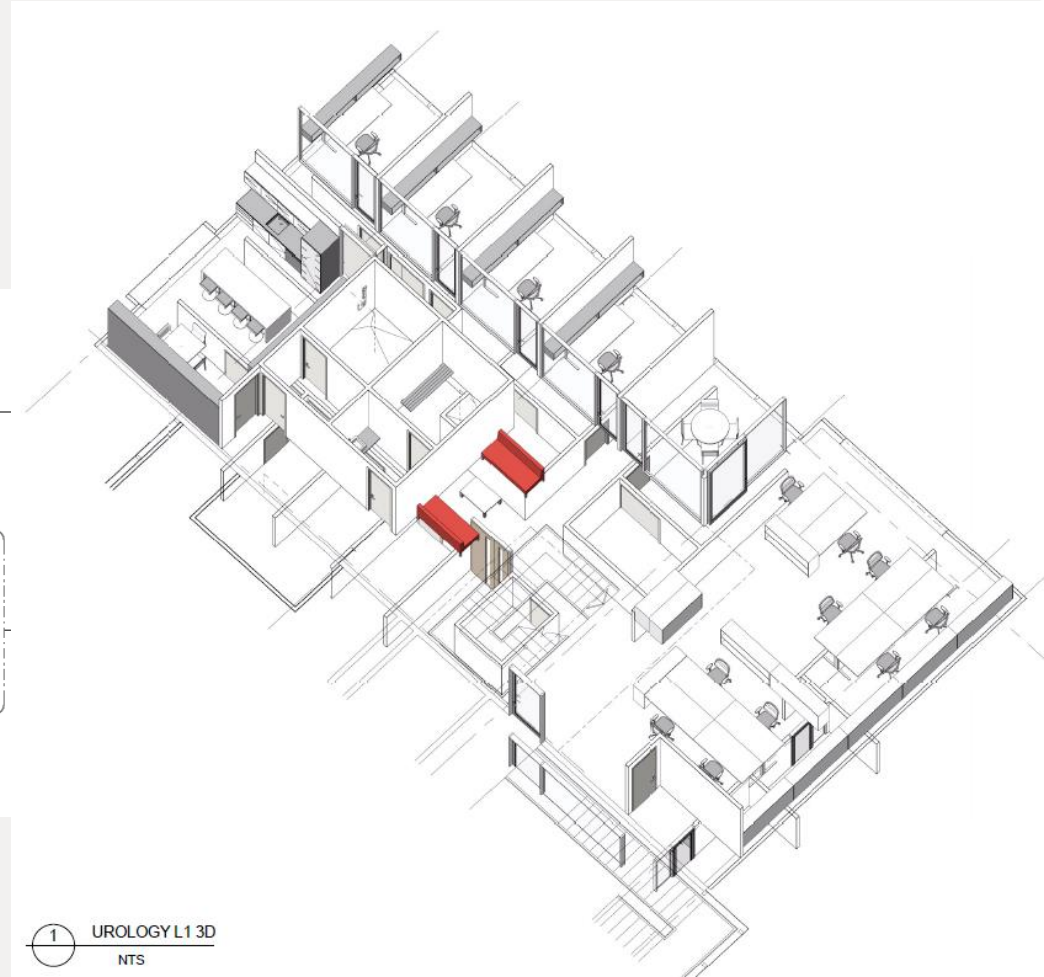


1 MONITECH 3D  
NTS

# BIM Management



1 LEVEL 1 O/A PLAN  
1:200 ©A3



1 UROLOGY L1 3D  
NTS

# 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

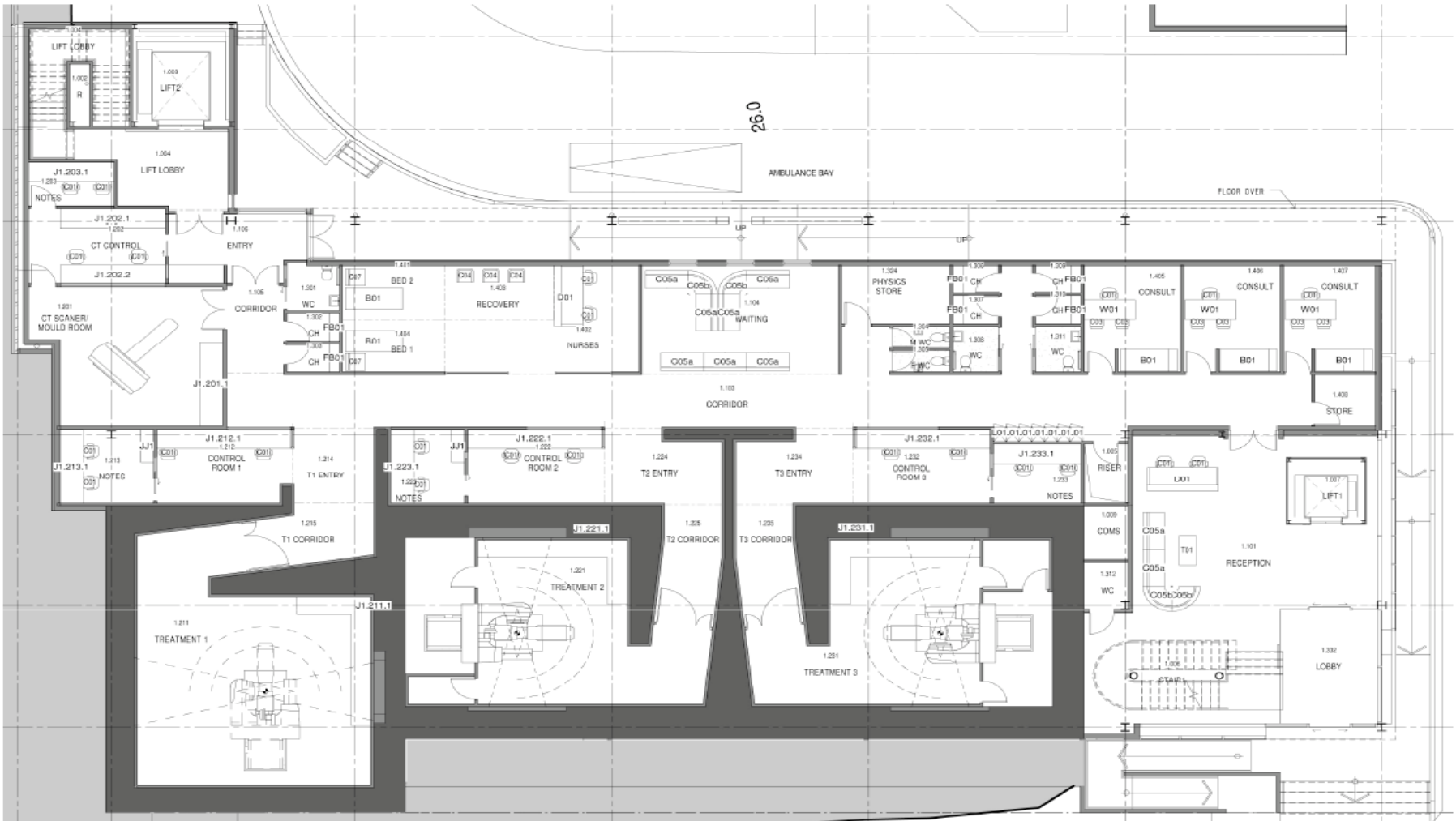
GEOTECHNICAL ENGINEER  
TERRANE CONSULTANTS

# Kathleen Kilgour Centre





# 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

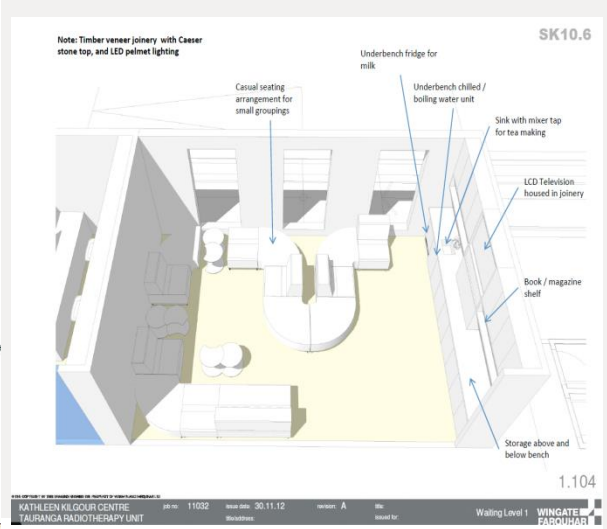
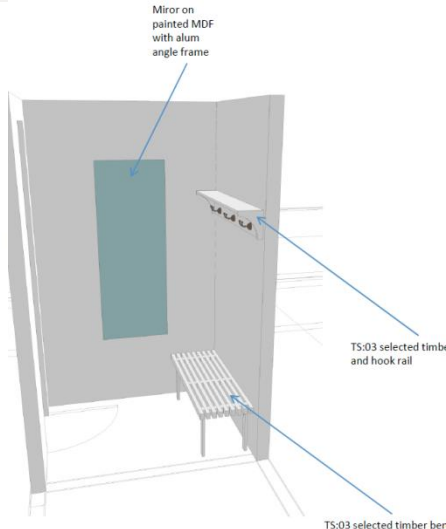
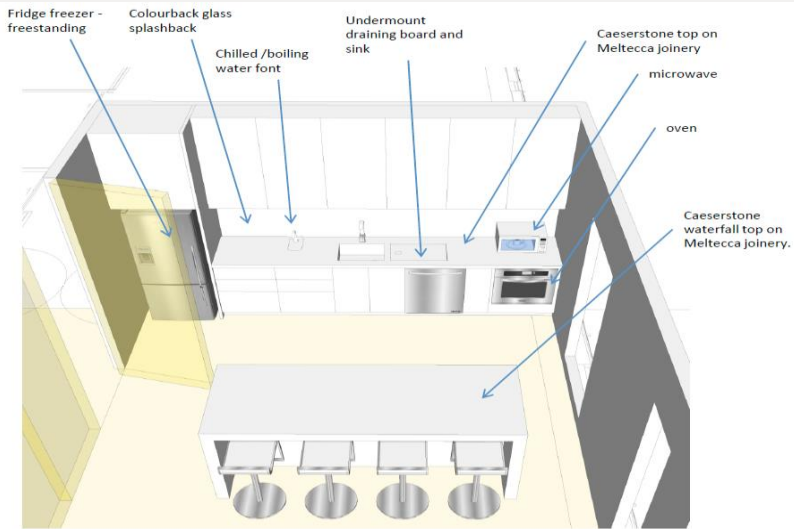
title:

issued for:

LAYOUT  
LEVEL 1

WINGATE  
FARQUHAR

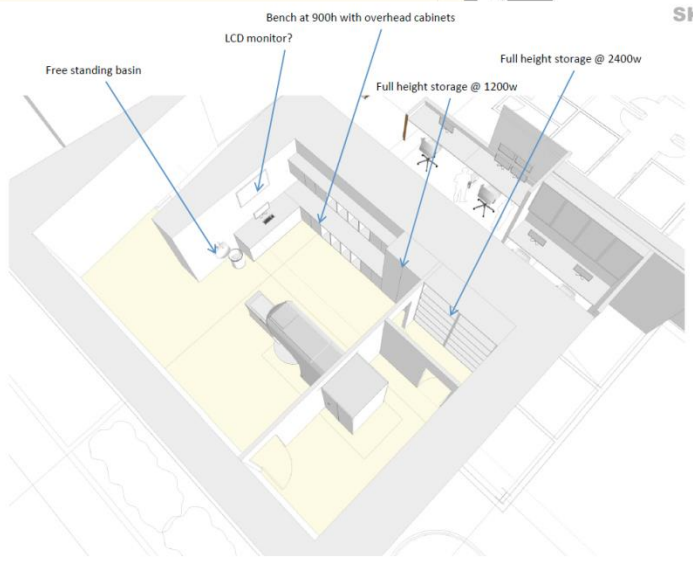
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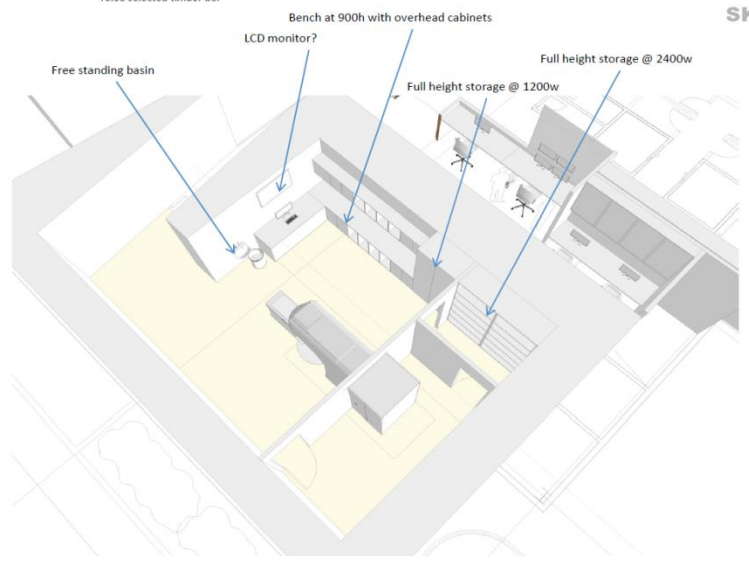
SK10.15

SK10.15

KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT  
job no: 11032 issue date: 30.11.12 revision: A title: Walling Level 1  
WINGATE FARQUHAR



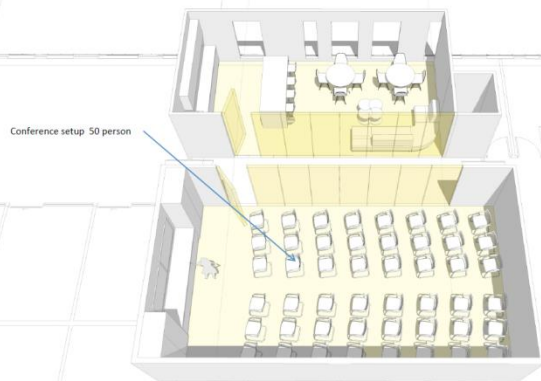
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1.231



1.221  
1.231

# BIM Management

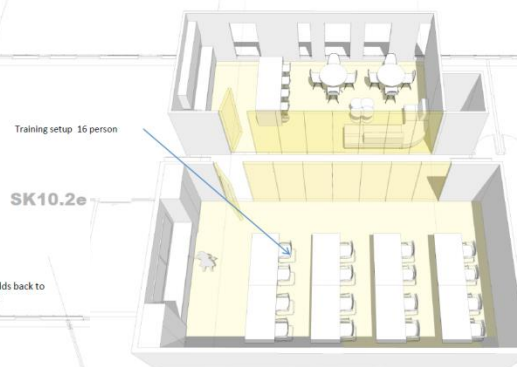
SK10.2



KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT

job no. 11032 issue date: 30.11.12 revision: A title: issued for:

SK10.2b



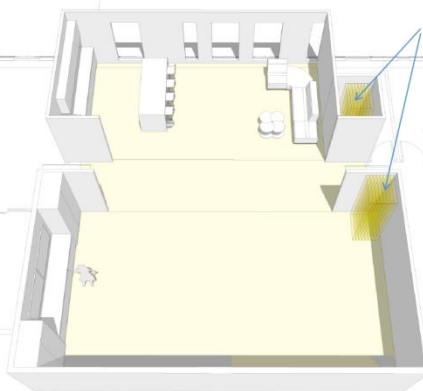
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KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT

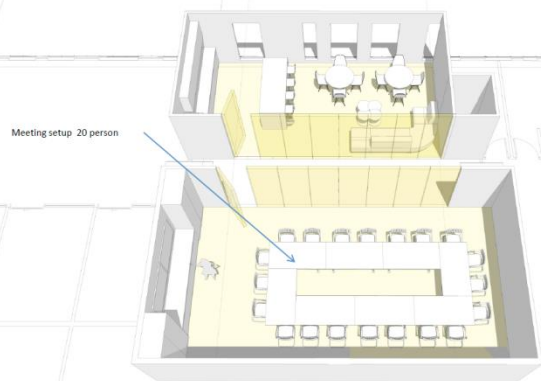
job no. 11032 issue date: 30.11.12 revision: A title: issued for: Meeting/Breakout WINGATE FARQUHAR

3.410

Operable wall folds back to create one space



SK10.



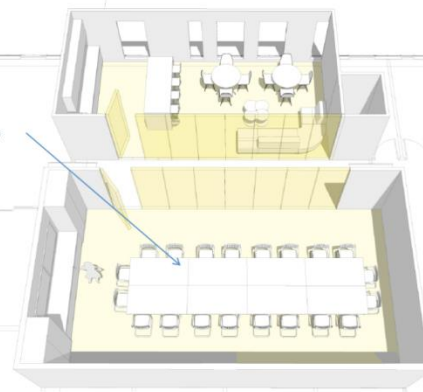
KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT

job no. 11032 issue date: 30.11.12 revision: A title: issued for: Meeting/Breakout WINGATE FARQUHAR

3.410

3.410

Meeting setup 20 person



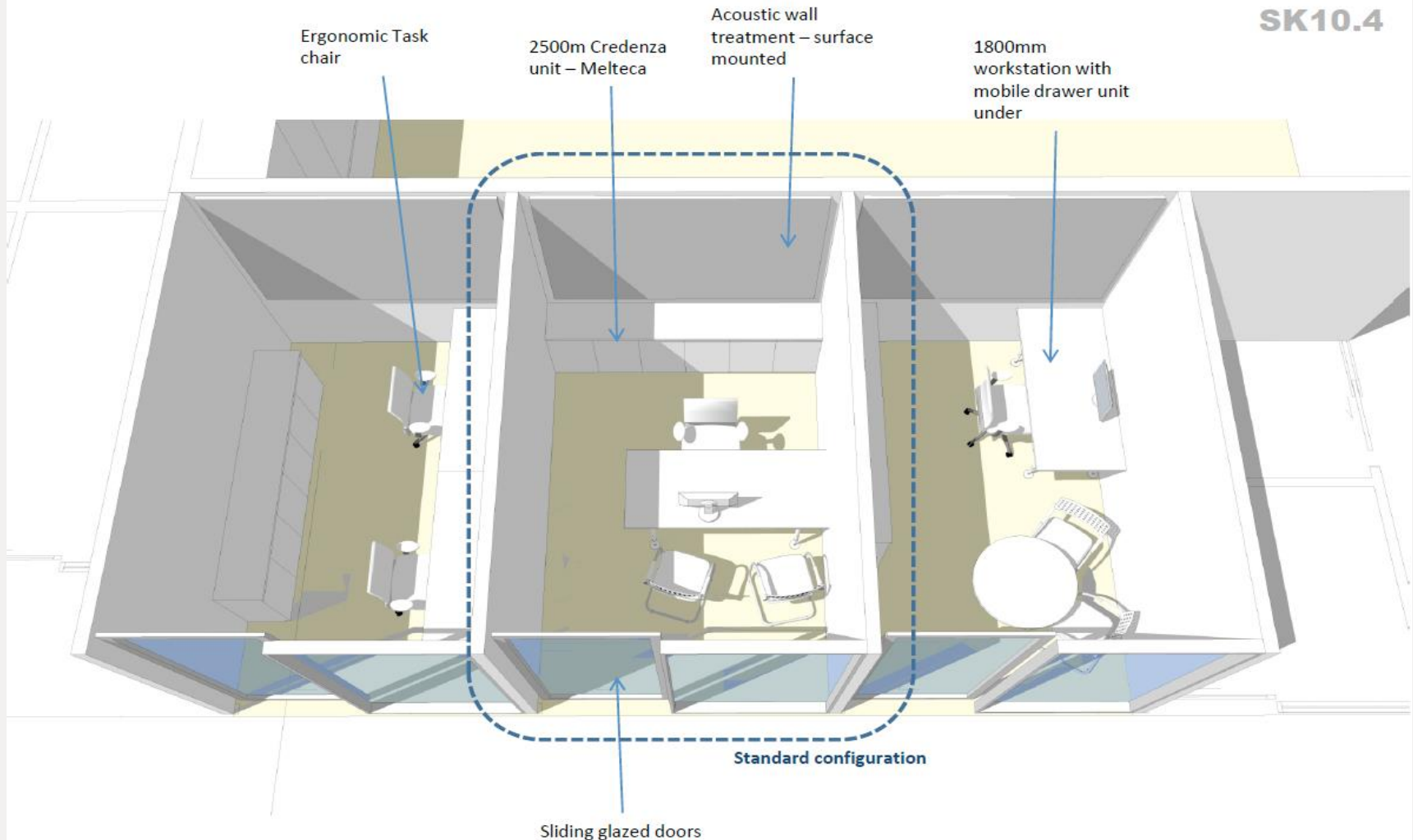
KATHLEEN KILGOUR CENTRE  
TAURANGA RADIOTHERAPY UNIT

job no. 11032 issue date: 30.11.12 revision: A title: issued for: Meeting/Breakout WINGATE FARQUHAR

3.4

# BIM Management

SK10.4



**BIM**



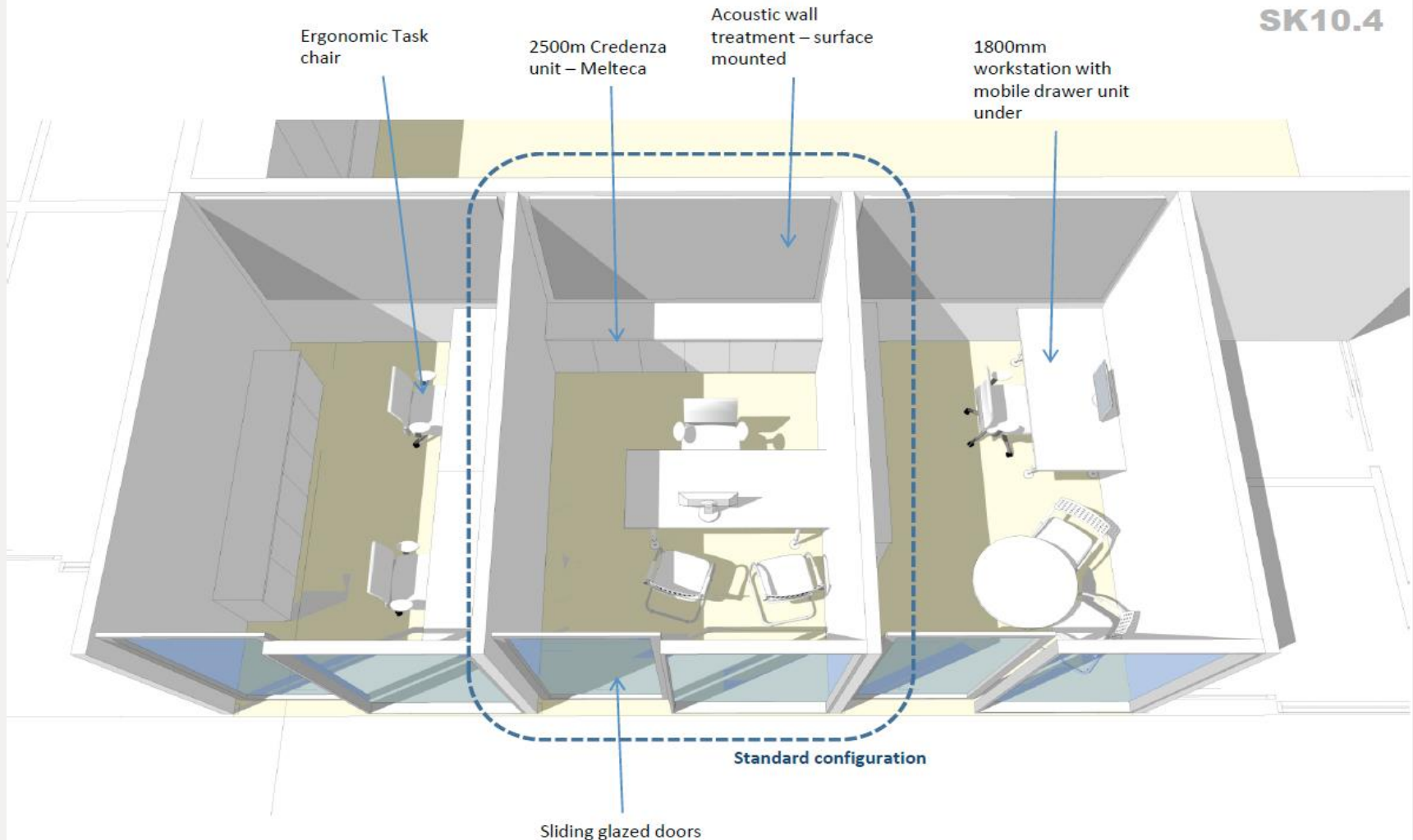
**THE  
BUILDING  
INTELLIGENCE™  
GROUP**

# BIM Management



# BIM Management

SK10.4



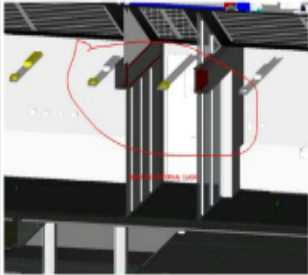
**PROJECT:** Kathleen Kilgour Center

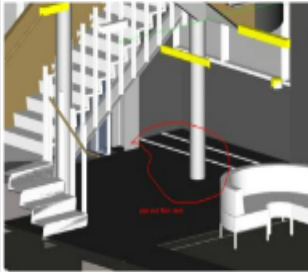
**DATE:** 26 June 2013

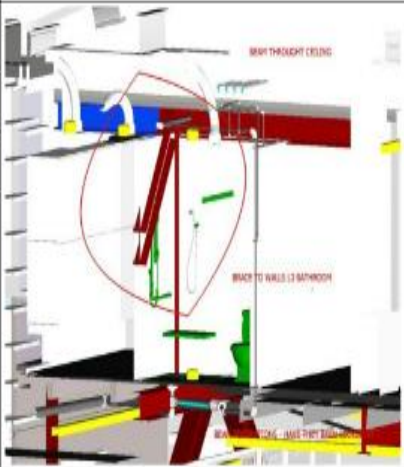
Action Has been done

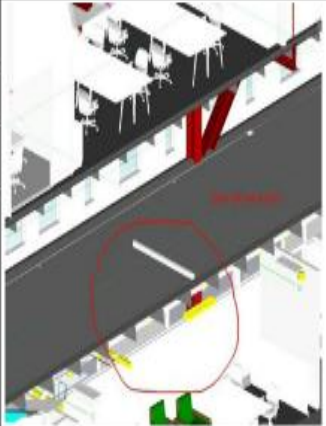
Action is pending

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	

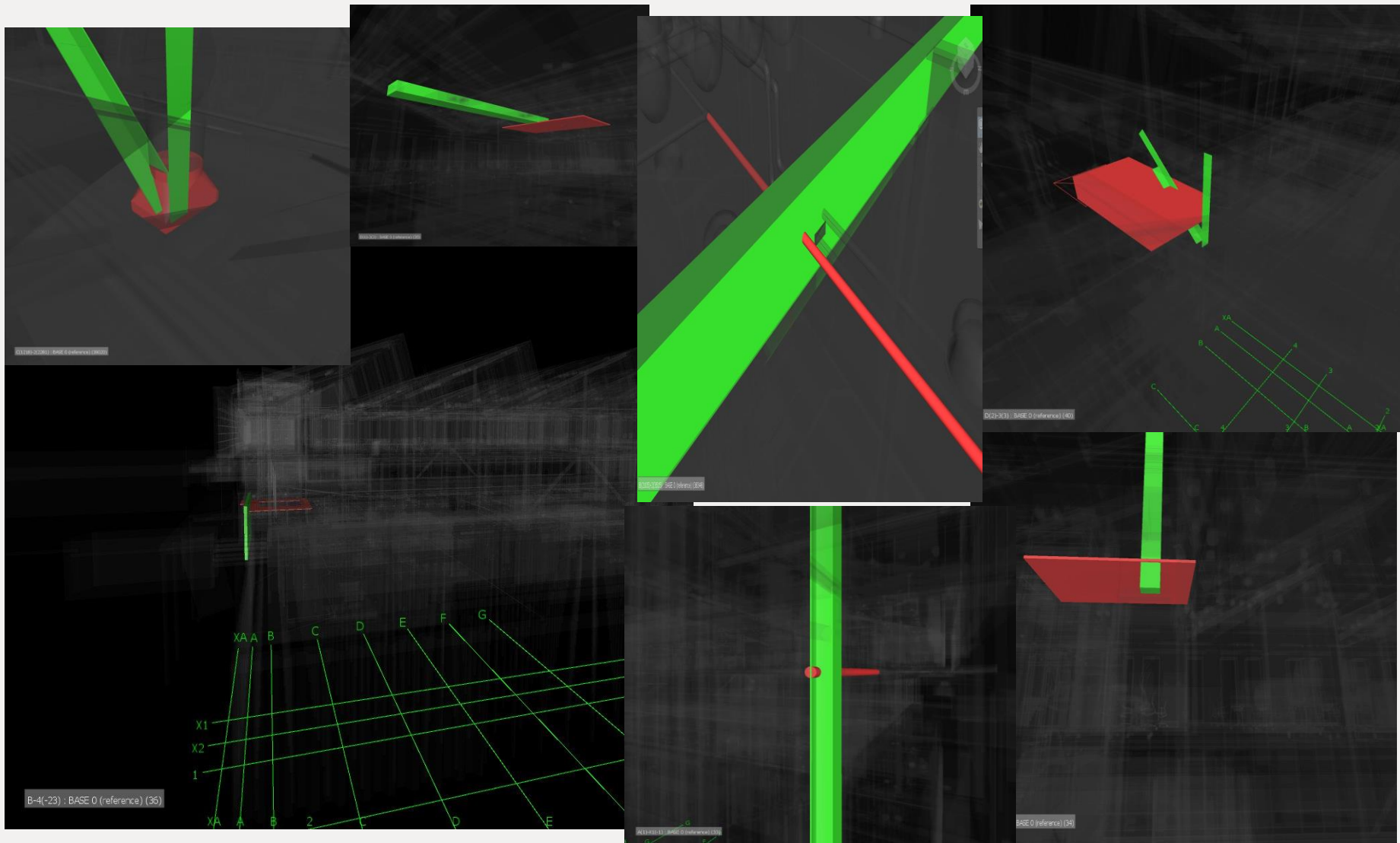


KKC Clash detection  
 Critical Clash Detection Matrix  
 6th September 2013

	ARCH	ELEC	FIRE	HYDR	MECH	STRUC	Comments
Walls- Partition							
Walls- Curtain Wall							
Doors- Interior							
Doors- Exterior							
Floors- Finish							
Roofs							
Ceilings							
Furniture							
Stairs							
Railings							
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							
Walls- Partition							Electrical Equipment & Mech equipment tested together 39
Walls- Curtain Wall							Important Issue 12
Doors- Interior							0
Doors- Exterior							0
Floors- Finish							0
Roofs							0
Ceilings							Ceilings to Pipes total = 93 231
Furniture							0
Stairs							0
Railings							0
Ramps							0
Casework/Joinery							0
Specialty Equipment							0
Lift Shaft							7 Total when tested against all 7
Electrical Equipment							0
Electrical Fixtures							0
Lighting Fixtures							0
Electrical Circuits							0
Wires							0
Telephone Devices							0
Nurse Call Devices							0
Security Devices							0
Communication Devices							0
Data Devices							0
Lighting Devices							0
Switch System							0
Fire Alarm Devices							0
Plumbing Fixtures							Indicatively modelled downpipes - not modelled on exact route - for Architectural coordination only 45
Piping Systems (Domestic cold)							Some of the Structural framing clashes are important 57
Piping Systems (Domestic Hot)							21
Piping Systems (Hydronic supply)							3
Piping Systems (Hydronic return)							6
Piping Systems (Sanitary)							*Sanitary pipes need to be sleeved 229
Piping Systems (Gas)							/ collared within Slabs 3
Pipe Fittings							0
Flex Pipes							0
Pipe Accessories							0
Mechanical Equipment							Clash with Rods & Access zone 4
Ducts							Important Issue 15
Duct Fittings							0
Air Terminals							Important Issue 5
Duct Systems							0
Duct Accessories							These were run as the clashes deemed important 15
Flex Ducts							0
Walls- Structural							0
Floors- Structural							2
Structural Foundations							0
Structural Framing- General							1
Structural Columns							0
Structural Stiffeners							0
							Total clashes: 725

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

# How we do it



# KKC Case Study

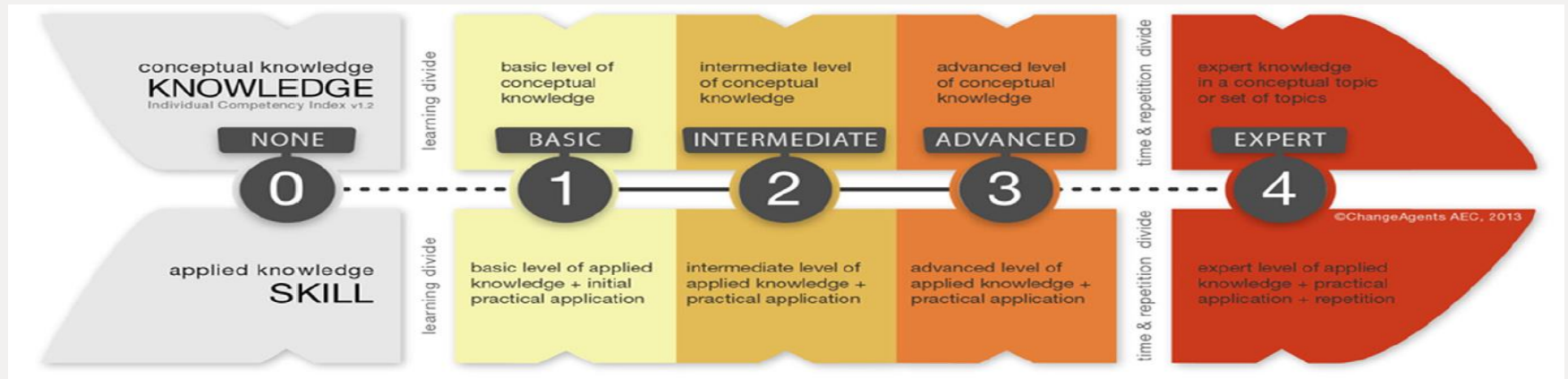
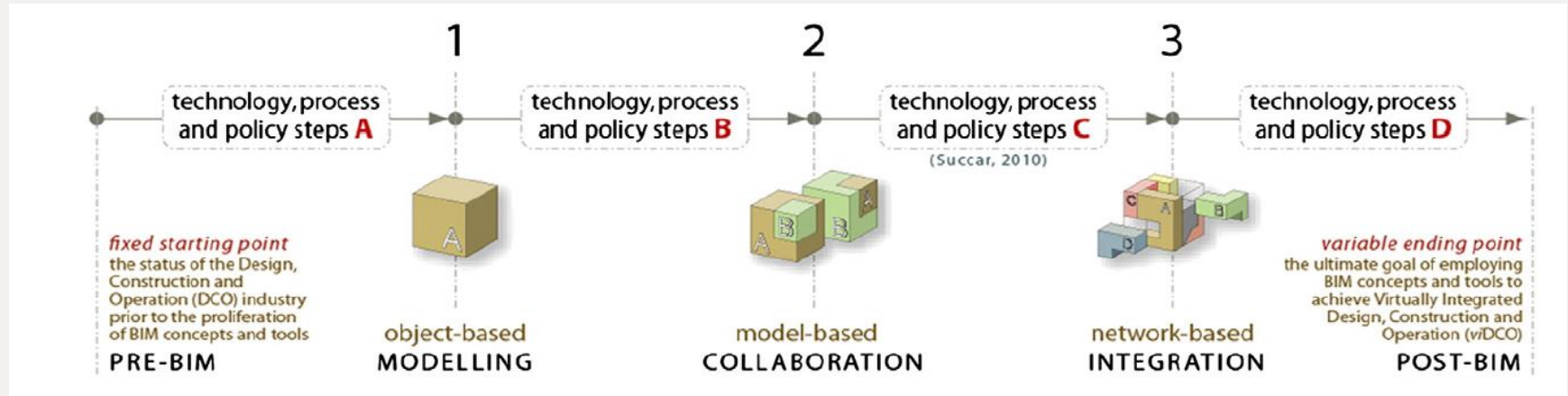
BUILDING INFORMATION MODELLING (BIM) – MEASURING INDIVIDUAL BIM COMPETENCIES OF PARTICIPANTS IN A NEW ZEALAND HEALTH PROJECT 2013

**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%

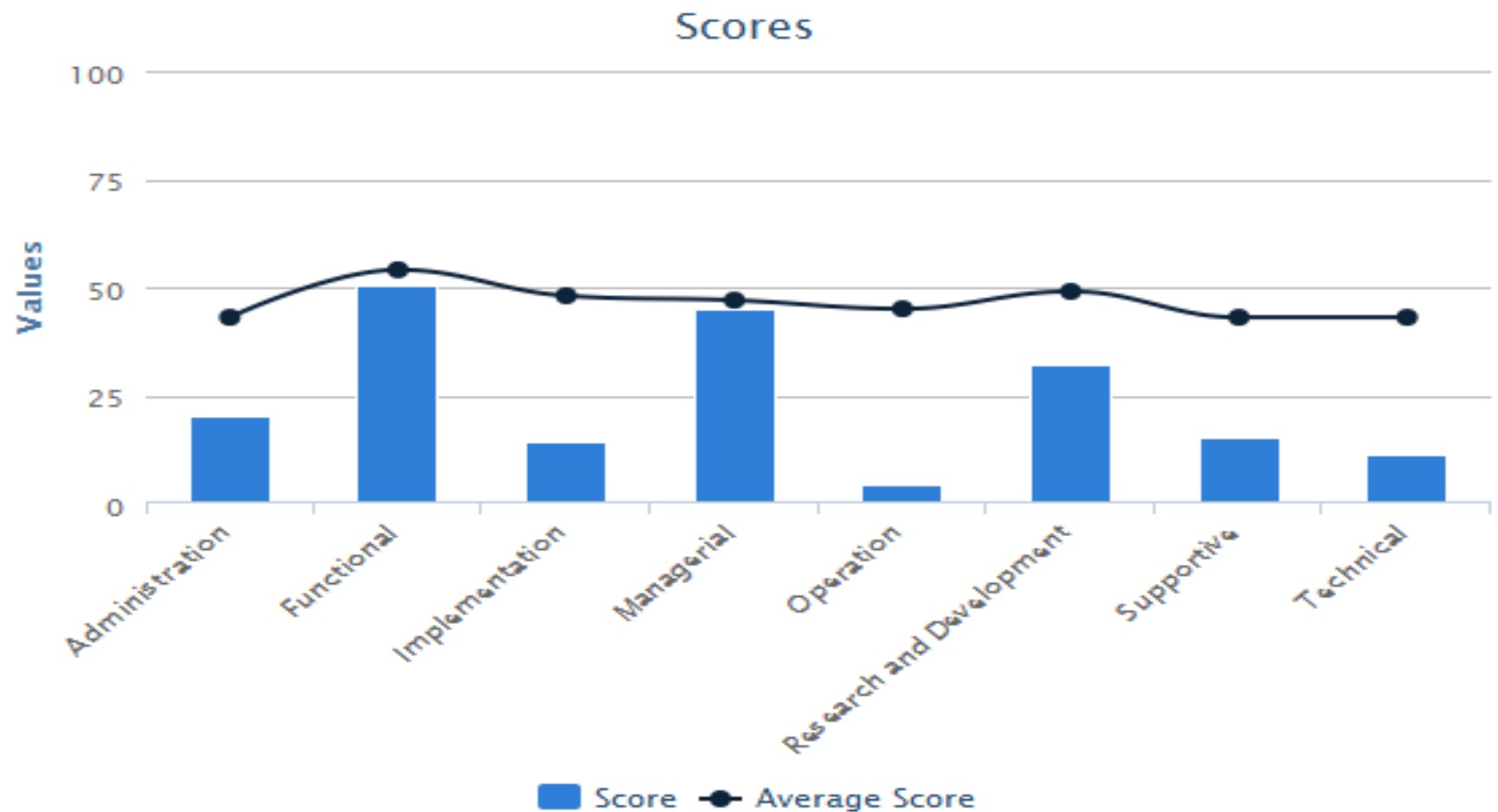
Table 2: BIM Google Scholar Search

# KKC Case Study

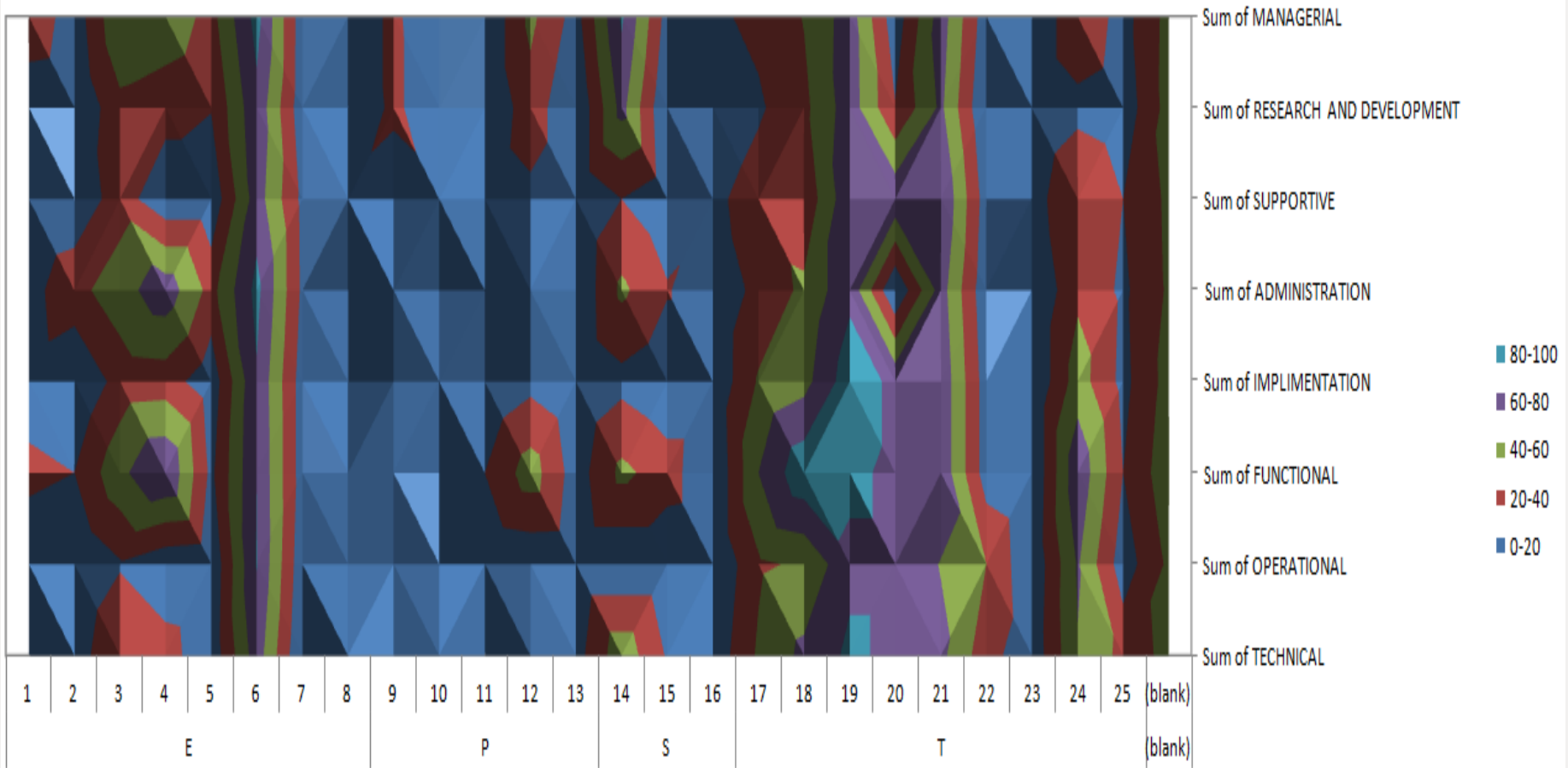


# KKC Case Study

## 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



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# BIM Benefits

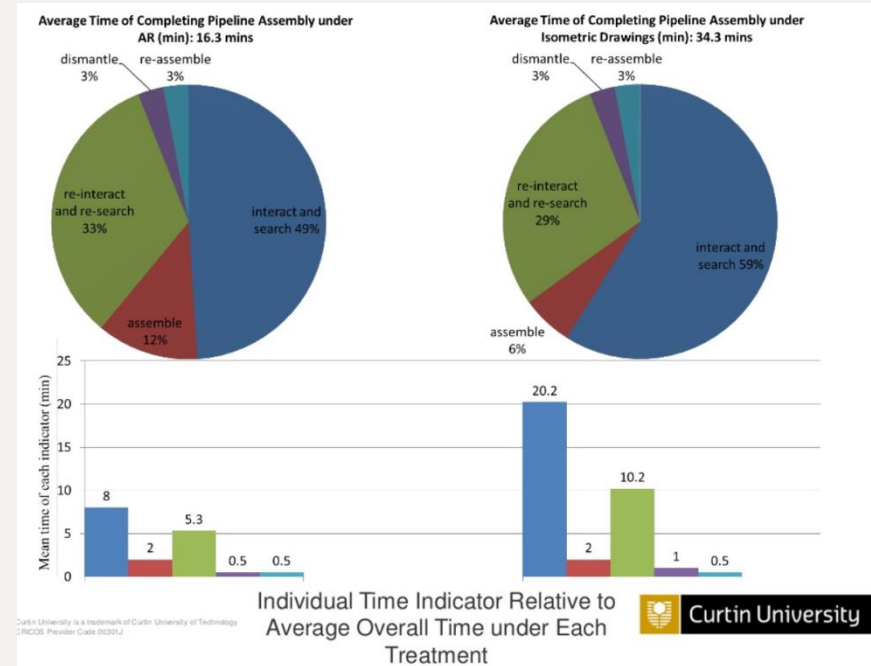


Figure 1. Industry BIM Leadership vs. Expected BIM Benefits v1.0

# BIM Benefits

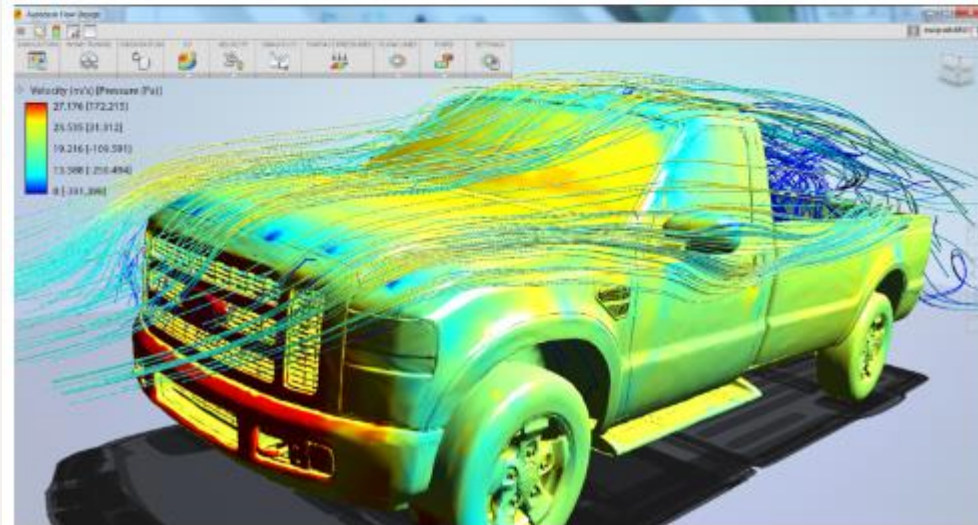
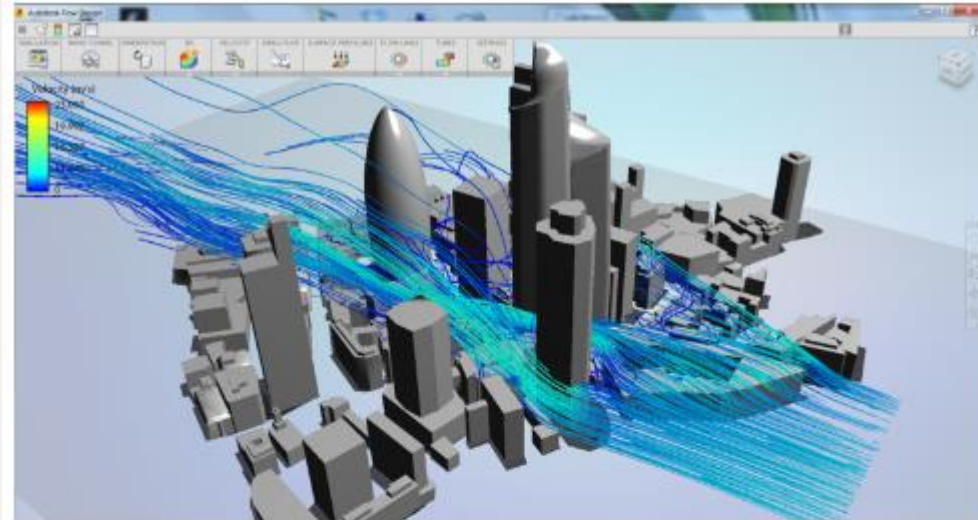
New Frontier technologies are paving the way...

- 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

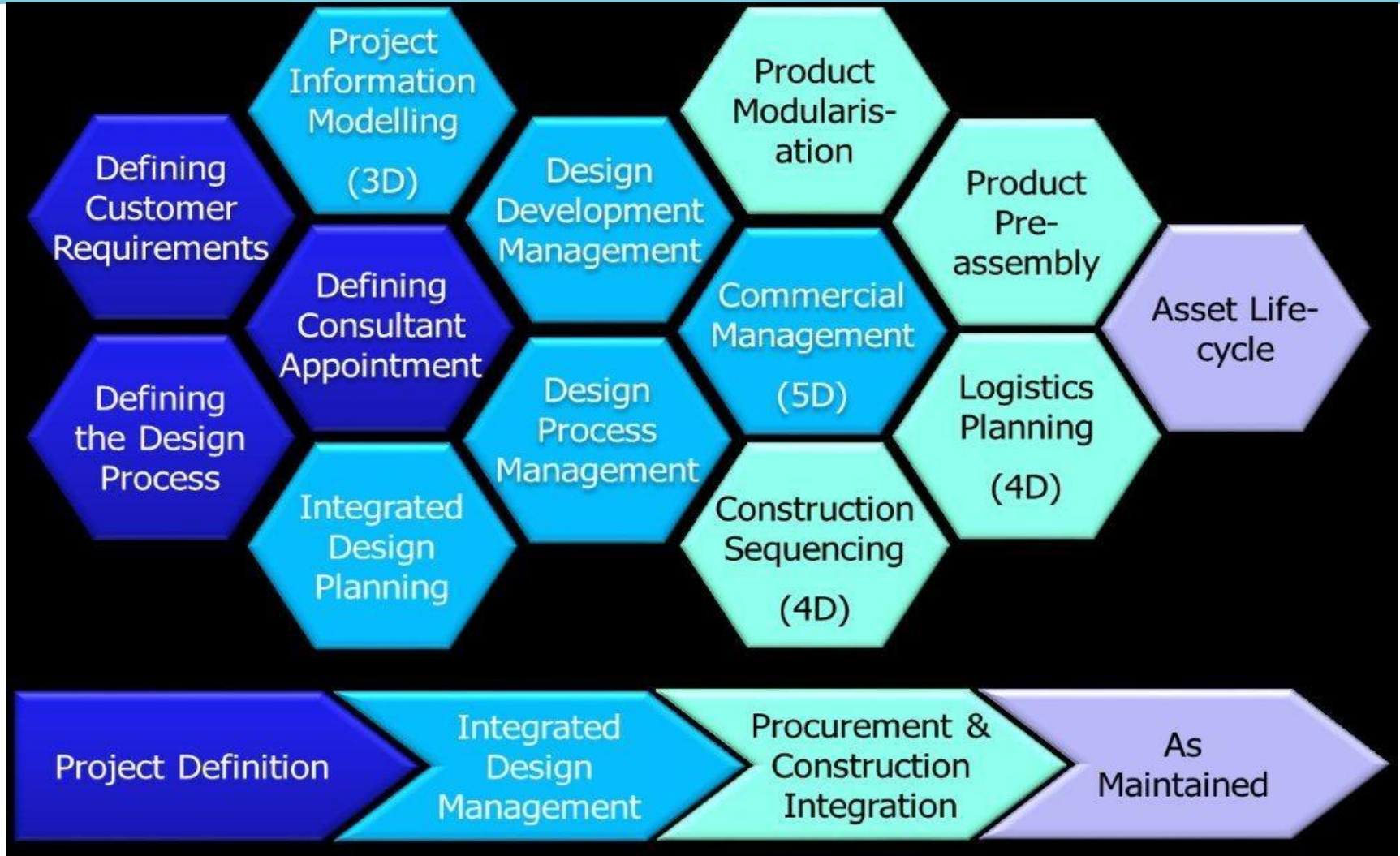
- Safety – Robotics, Trend of military & mining now using drones
- AI – Sensors, i.e. Self Driving Cars, Sensor in the concrete truck example
- BIG Data – Cameras & Surveillance everywhere, Retail data collection
- Youth Trends – Connected, Social, intuitive
- GIS – Geobuild [GeoBuild™](#) – [National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



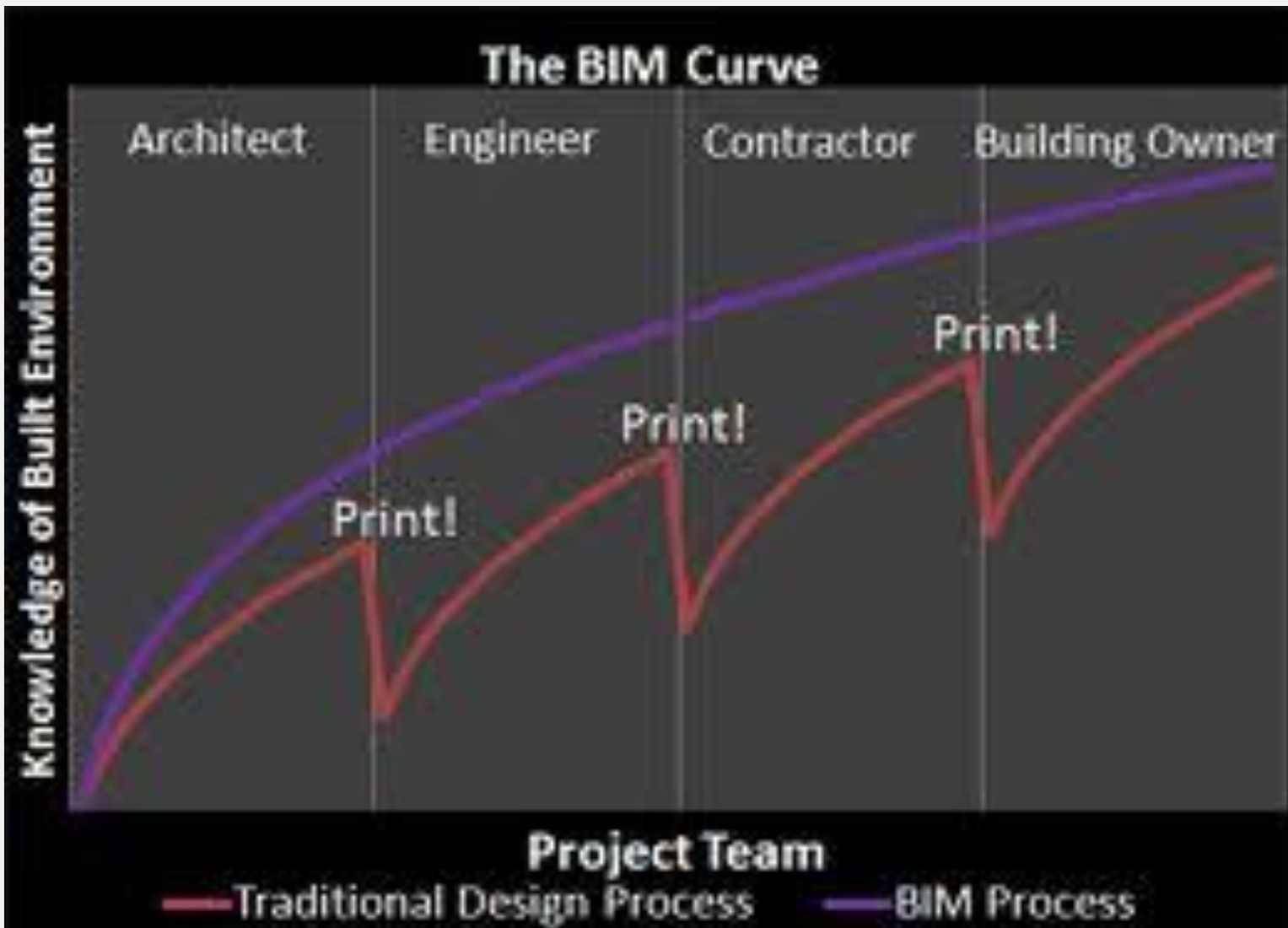
# BIM Risks

- 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

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

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**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

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**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

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- Edit email notification settings

### Resources

- Help
- Success And Training Corner
- Box Community

# Q & A.