

MULTIPLEX
Built to outperform.

BIM at the Perth Stadium





Agenda

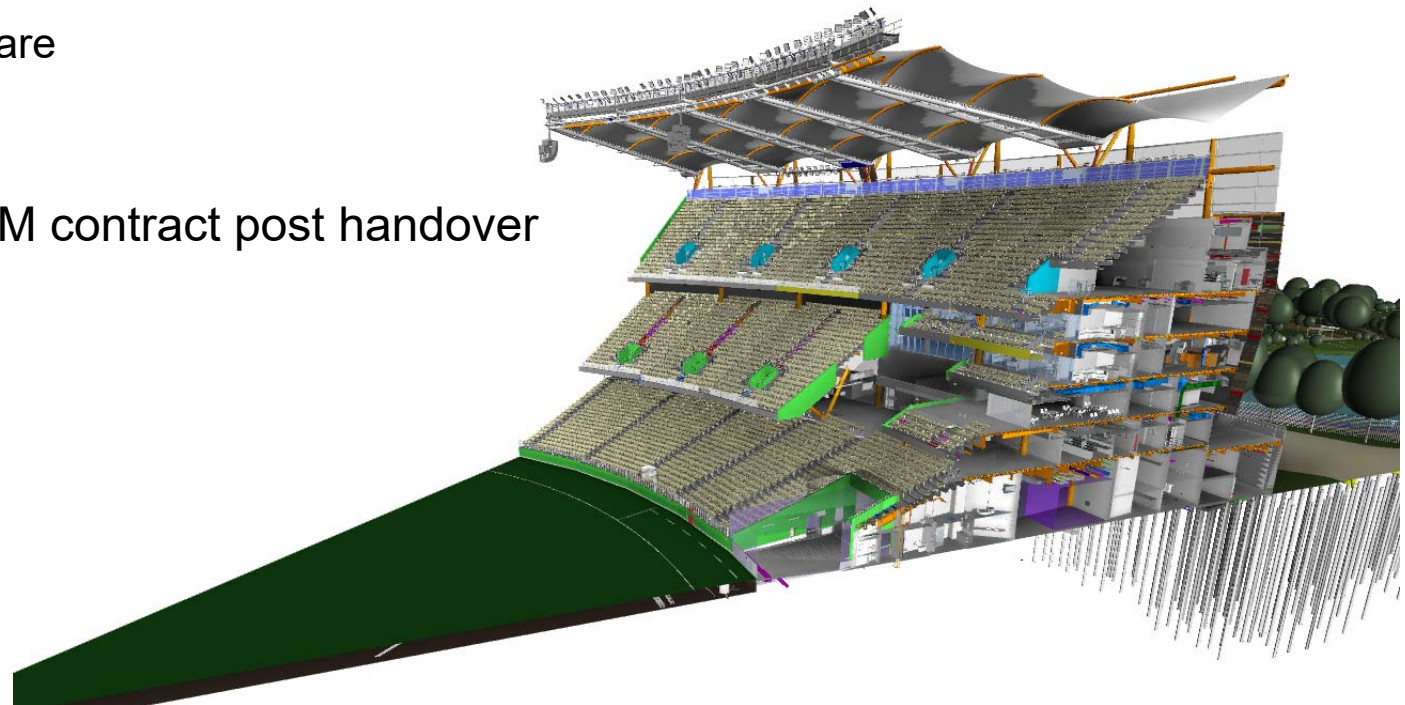
- BIM requirements on Perth Stadium project
- Project BIM highlights
 - Project benefits
 - Client benefits
 - Contractor benefits
- BIM hurdles
 - Contracts & timing of information
- The future of BIM & the information age





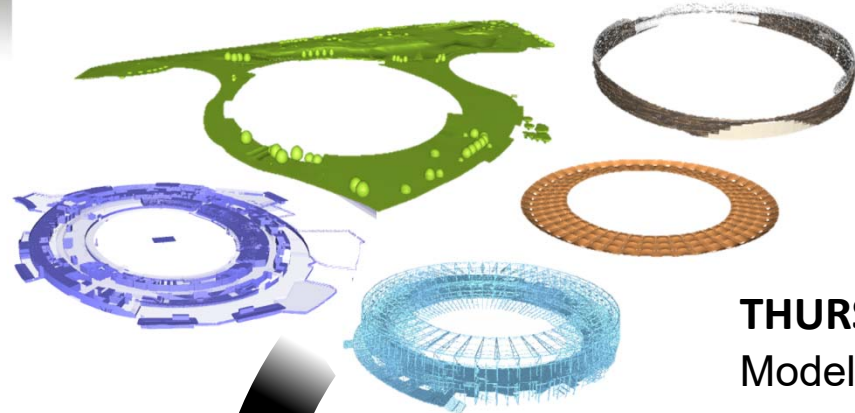
Perth Stadium BIM Requirements

- Briefed LOD 500 by State Government
- Collaborative relationship between Multiplex & State
 - BIM consultants (PDC) to assist with setup
 - Project software
- BGIS 25 year FM contract post handover





Weekly Workflow



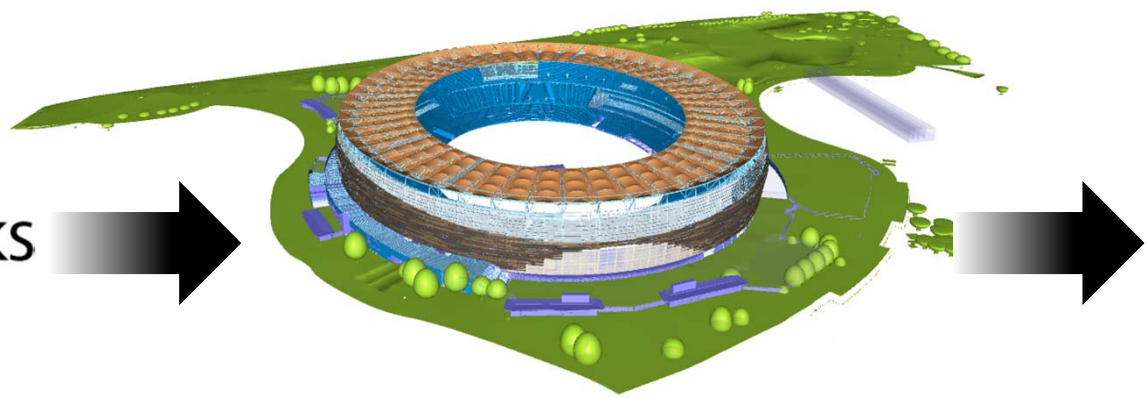
THURSDAY AFTERNOON
Model pieces are uploaded to the cloud

THURSDAY EVENING
Model pieces are synced to Multiplex site computers

THURSDAY OVERNIGHT
Model pieces federated and processed in Navisworks using iConstruct



FRIDAY MORNING
Federated model issued to the project team for use the following week

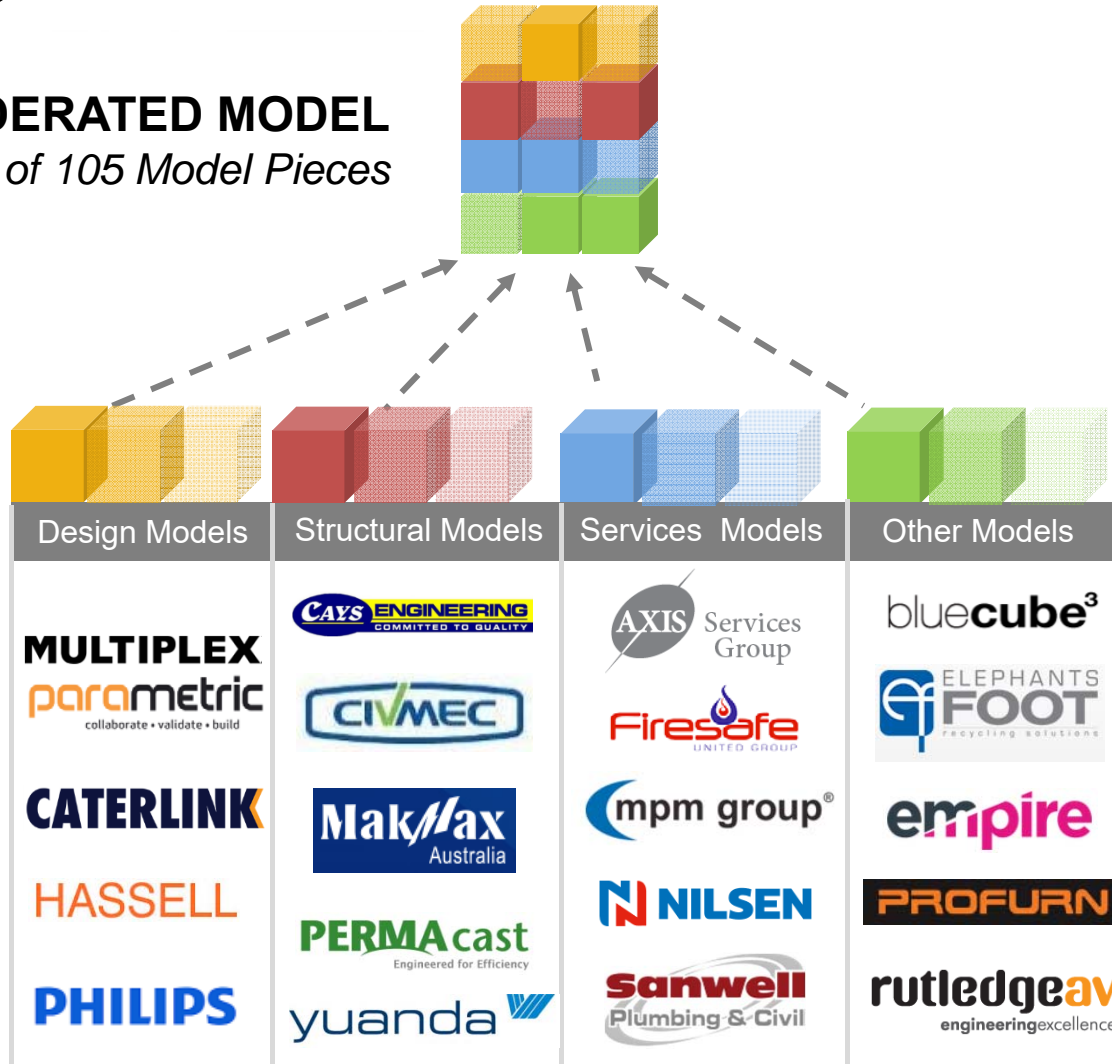
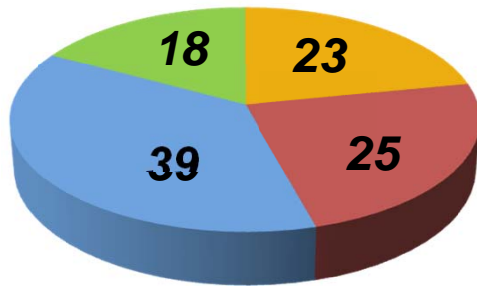




Contributing Disciplines

FEDERATED MODEL
Currently made up of 105 Model Pieces

- Design model pieces
- Structural model pieces
- Services model pieces
- Other model pieces





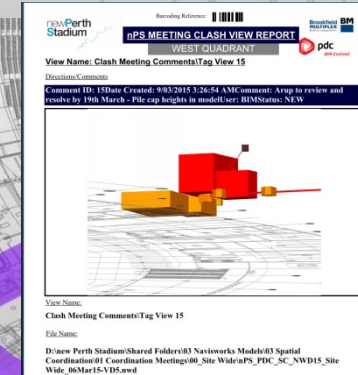
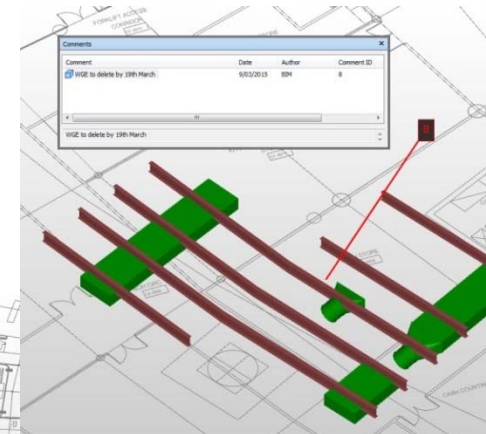
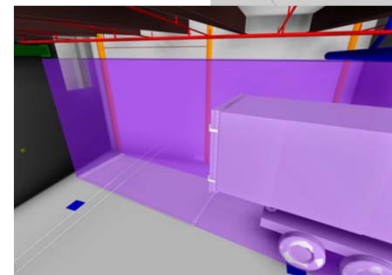
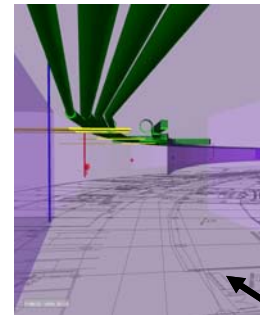
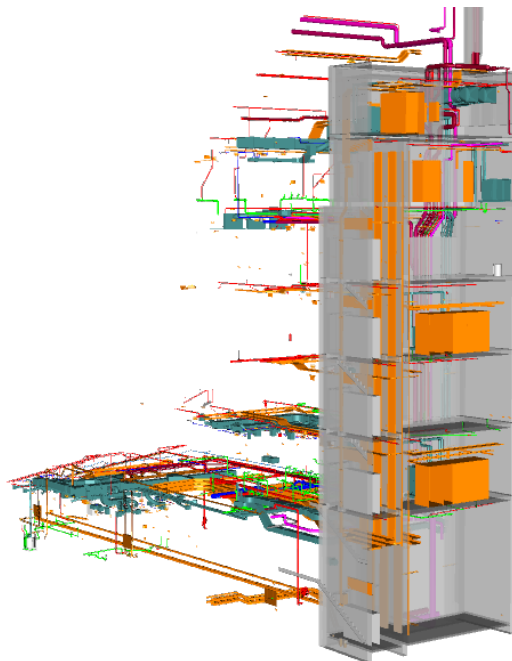
Design Benefits – Weekly Coordination

Coordination using BIM in weekly meetings & daily workflows

- Weekly design coordination meetings w/meeting actions minuted in the model
- Specific models eg. core coordination

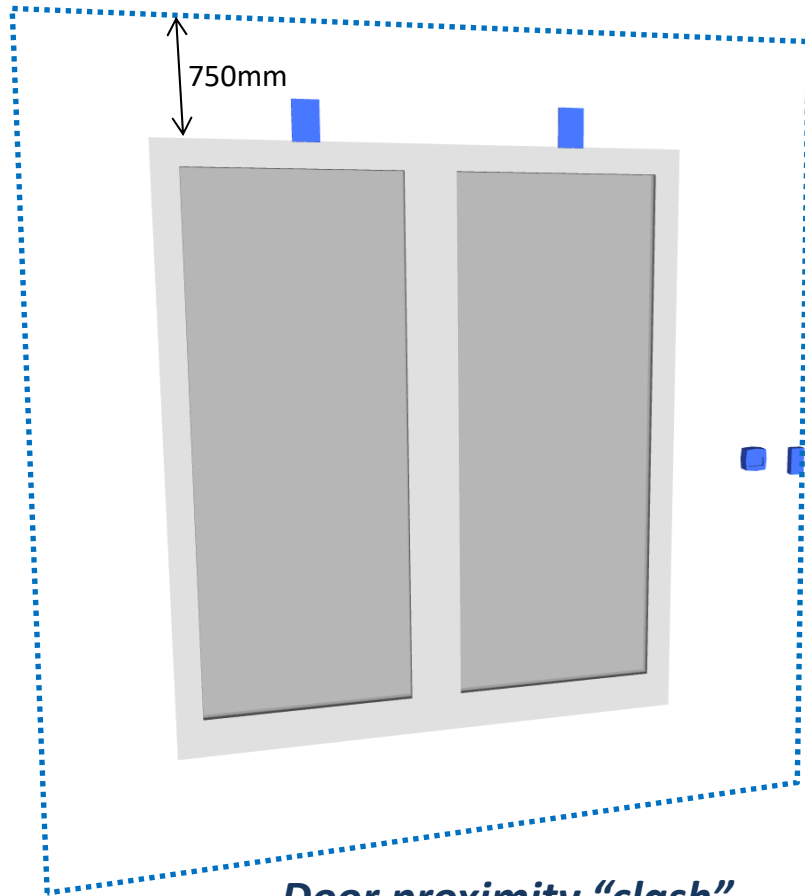
Clash Detection

- Progressive clash in sync with program
- Access & clearance zones





Proximity “Clashes” – Thinking outside the box

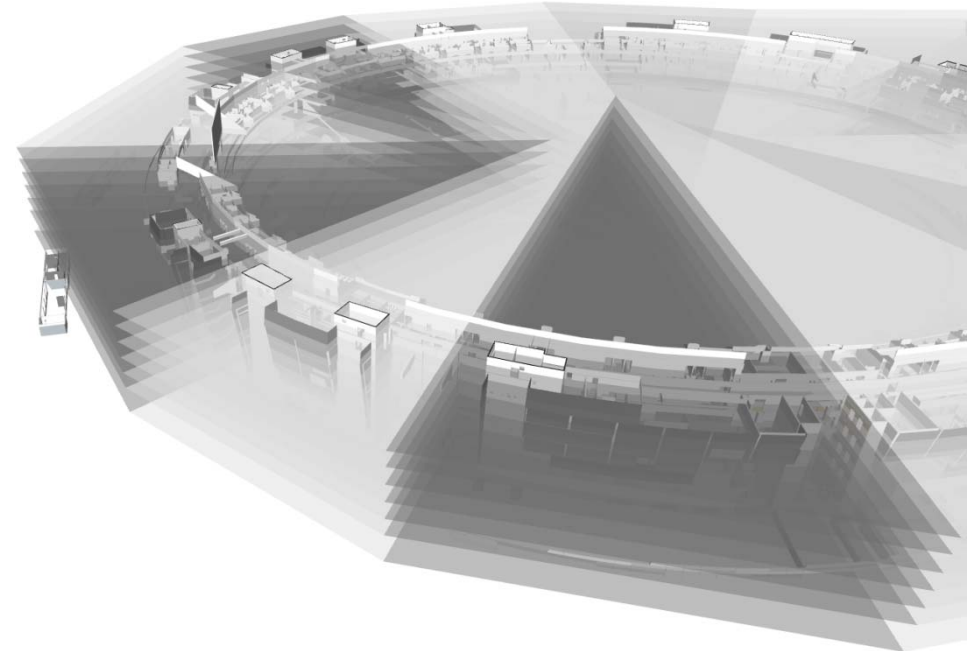


Door proximity “clash”

Using clash methods to link objects & information

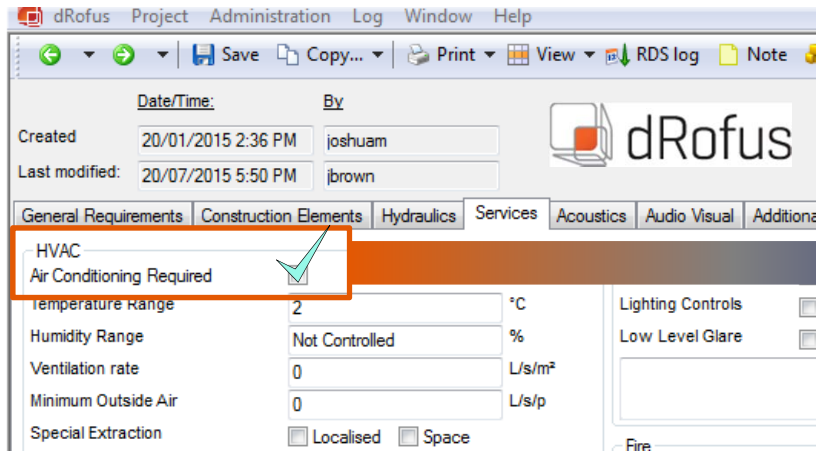
- Connecting security devices to respective doors
- Creating object to clash and attach information
- Clashing items to add grid location information

Wall types within sectors

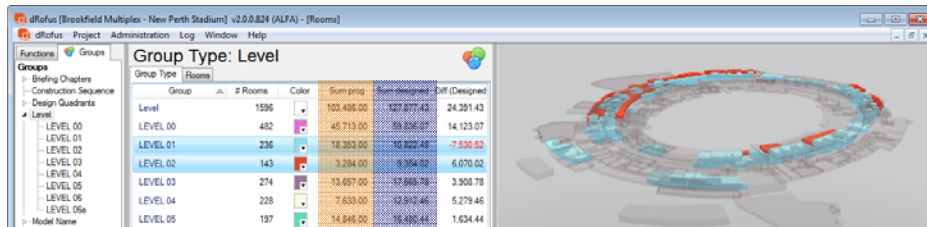




Data Management and Visual Reporting



Schedule of Accommodation



Central information synced onto plans:

(visual reporting/communication tool)

- Room Information (A/C or not)
- Delayed Procurement areas
- Site Status

BRIEF AREAS
(dRofus database)

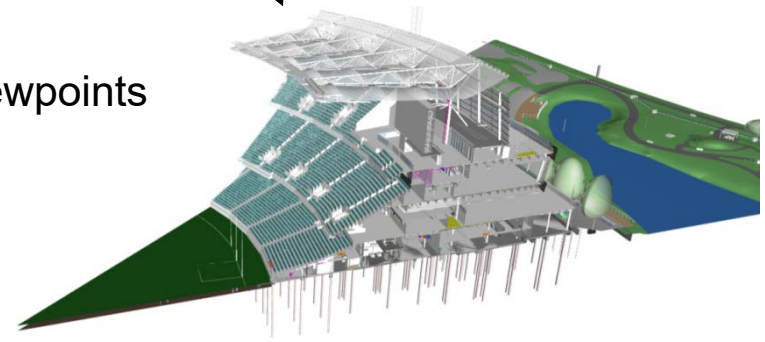
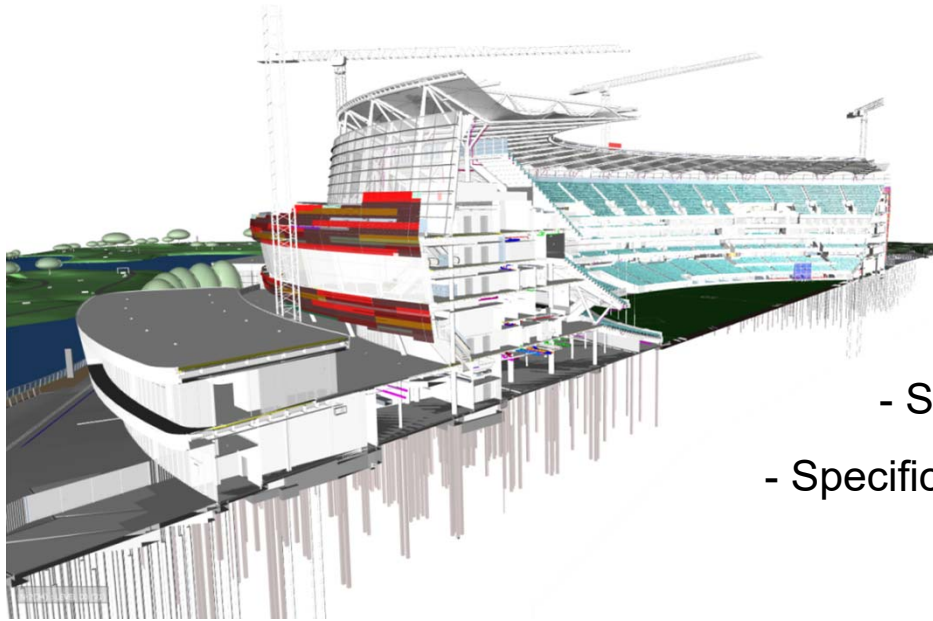
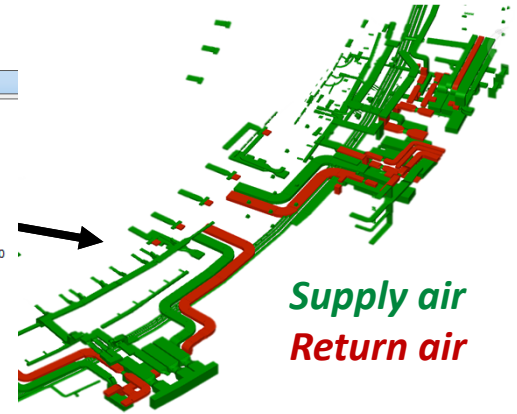
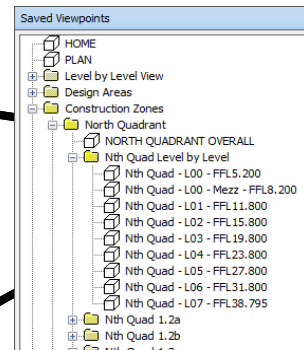
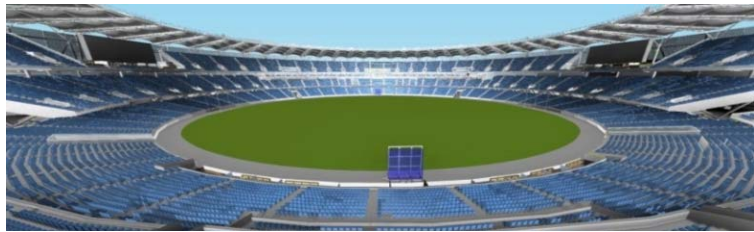
MODEL AREAS
(Revit)

Area comparison



Client & Design benefits – Information Accessibility

Making BIM Accessible by collating **2.2GB** of information weekly..



- Saved viewpoints
- Search sets
- Specific models

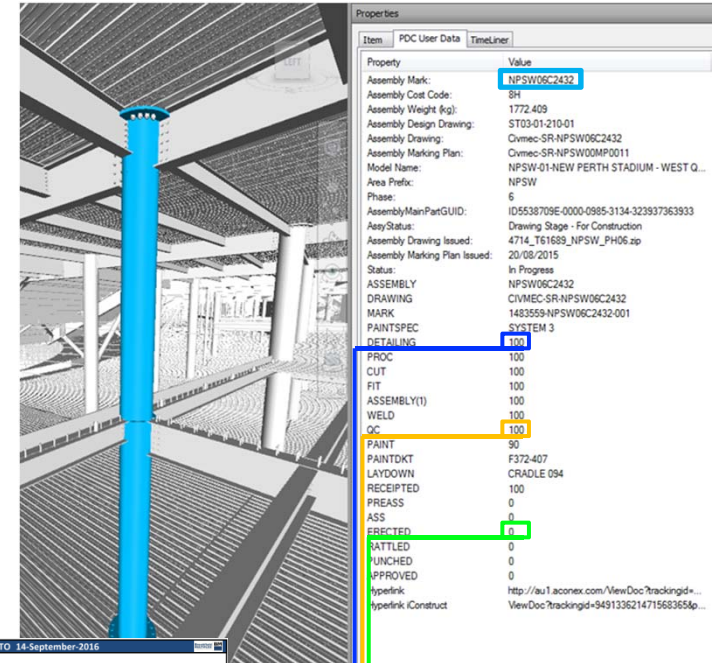


Contractor Benefits - 4D Tracking & Reporting

- Adapt existing industry systems into BIM
- Construction status tracking available in the model
- Effective weekly reporting of current status

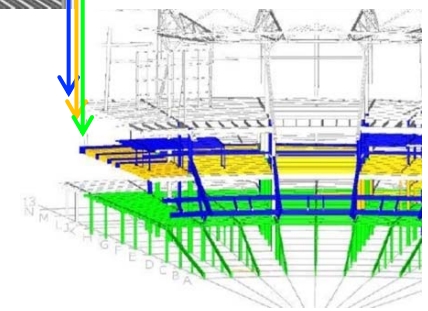
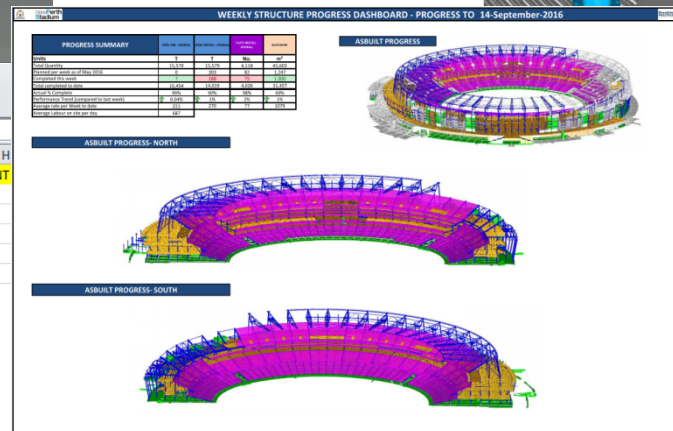


Link data



Item	POC User Data	TimeLiner
Property		Value
Assembly Mark:		NPSW06C2432
Assembly Cost Code:		311
Assembly Weight (kg):		1772.409
Assembly Design Drawing:		ST03-01-210-01
Assembly Drawing:		Civmec-SR-NPSW06C2432
Assembly Marking Plan:		Civmec-SR-NPSW00MP0011
Model Name:		NPSW-01-NEW PERTH STADIUM - WEST Q...
Area Prefix:		NPSW
Phase:		6
AssemblyMainPartGUID:		ID5538709E-0000-0985-3134-323937363933
AsyStatus:		Drawing Stage - For Construction
Assembly Drawing Issued:		4714_T61689_NPSW_PH06.zip
Assembly Marking Plan Issued:		20/08/2015
Status:		In Progress
ASSEMBLY		NPSW06C2432
DRAWING		CIVMEC-SR-NPSW06C2432
MARK		1483555-NPSW06C2432-001
PAINTSPEC		SYSTEM 3
DETAILING		100
PROC		100
CUT		100
FIT		100
ASSEMBLY(I)		100
WELD		100
OC		100
PAINT		50
PAINTDKT		F372-407
LAYDOWN		CRADLE 094
RECEIPTED		100
PREASS		0
ASS		0
ERECTED		0
RATTLED		0
UNCHED		0
APPROVED		0
hyperlink:		http://au1.aconex.com/ViewDoc?trackingid=...
hyperlink:		ViewDoc?trackingid=949133621471568365&p...

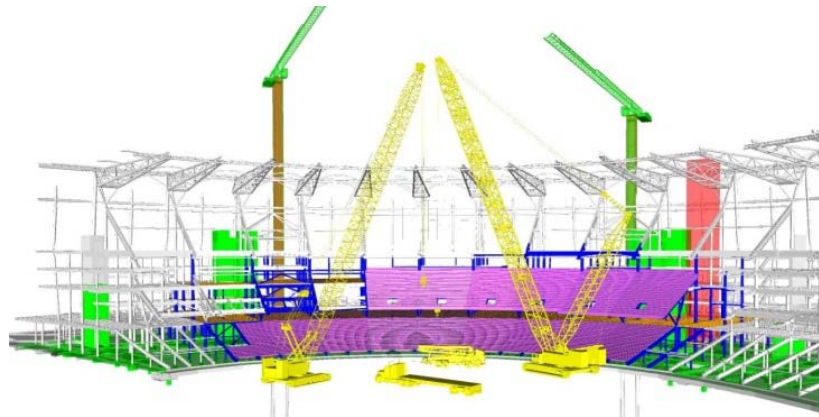
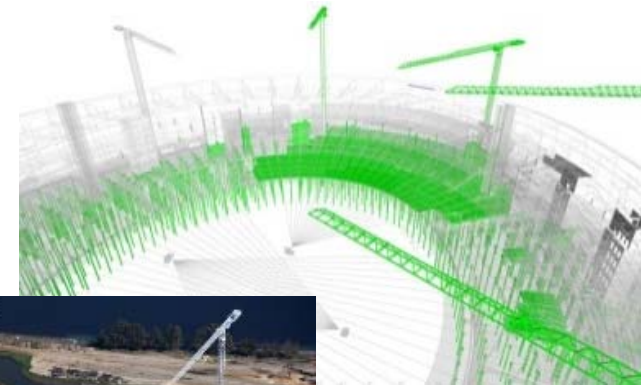
	A	B	C	D	E	F	G	H
1	Area Prefix:	ASSEMBLY	Assembly Drawing:	DETAILING	CUT	FIT	ASSEMBLY	PAINT
2	NPSW	NPSW06C2432	Civmec-SR-NPSW06C2432	100	100	100	100	90
3	NPSW	NPSW09B1032	Civmec-SR-NPSW09B1032	100	100	0	0	0
4	NPSW	NPSW03B1248	Civmec-SR-NPSW03B1248	100	100	100	100	100
5	NPSW	NPSW16B1026	Civmec-SR-NPSW16B1026	100	100	100	100	0
6	NPSW	NPSW09B1227	Civmec-SR-NPSW09B1227	100	100	100	100	90





4D Tracking & Reporting

- 3D Logistics planning with current site status as context
- Progress tracking, reporting, quantities and claims

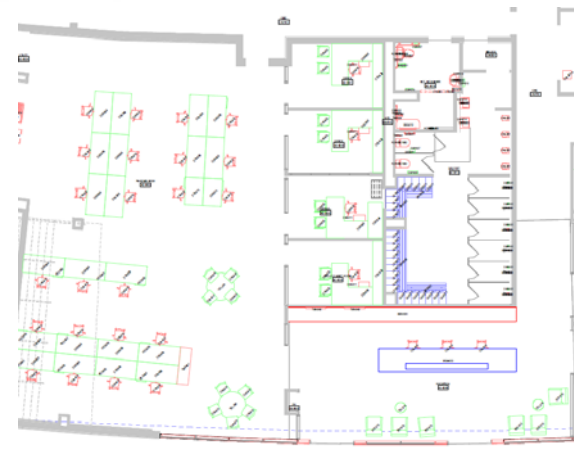


	A	B	C	D	E	F	G	H
1	Sum of Element Area		BIM360 Status					
2	Element Name	Element Groups: Design S	0-30% Commenced	100% Complete	30-70% In Progress	70-100% Near Complete	Not commenced	Grand Total
3	LEVEL 00	Q1S1		786.73	747.80		2404.06	3938.59
4		Q1S2		1008.83	78.17	4.74	1626.28	2718.02
5		Q1S3		1080.35	190.16		2890.94	4161.46
6		Q2S1			3011.60	3.07	4137.95	7152.63
7		Q2S2		2504.93	162.04	53.97	1038.47	3759.41
8		Q2S3	152.98	2886.93	684.26	158.03	1017.66	4899.85
9		Q3S1	557.90	1348.11	1492.88	29.55	452.60	3881.04
10		Q3S2	182.44	631.50	1682.27	137.65	345.66	2979.53
11		Q3S3		998.70	174.43		645.28	1818.40
12		Q4S1		738.44			963.50	1701.94
13		Q4S2		1846.63	323.01		910.39	3080.03
14		Q4S3	20.50	1422.91	281.85		2899.63	4624.89

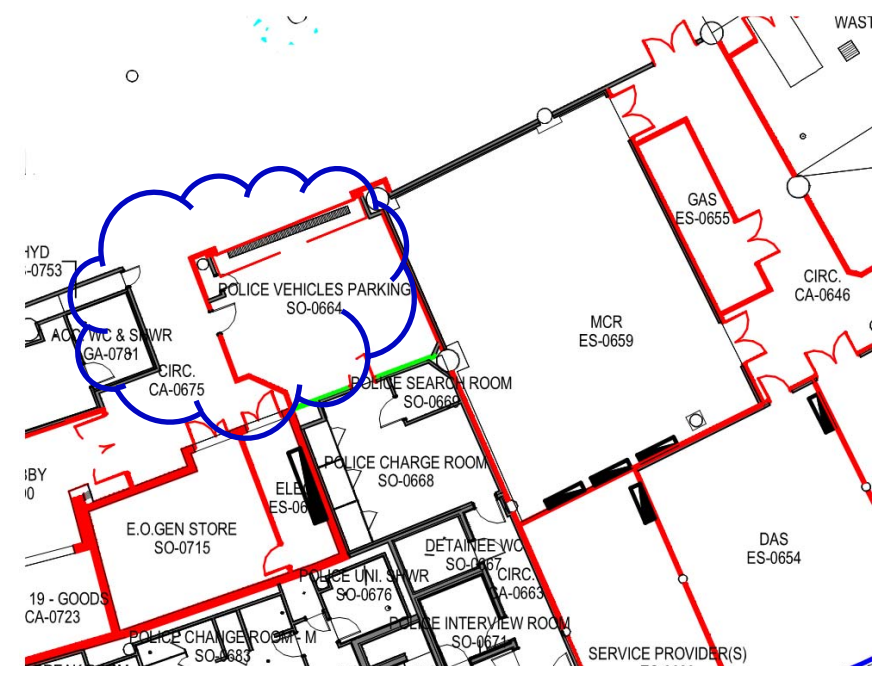


LOD300-500 Management

- Various Weekly GAs for information
 - FF&E procurement status
 - Overall GA plans
 - Blank GA plans
- QA views (fire and acoustic ratings, zone allocations etc.)
- Auto-revisioning door schedules



PACKAGE	LEVEL	D/S	DOOR #	TO ROOM #	LEAF 1 WIDTH	LEAF 2 WIDTH	LEAF HEIGHT	LEAF TYPE	LEAF MATERIAL	LEAF FINISH	FIRE RATING	ACOUSTIC RATING	HANDLE	LOCK	CLOSER	FRAME TYPE	FRAME FINISH
370	Internal Doors	LEVEL 01	0353	1-295	CA-1203	820	2400 D3	T	PA2					LS	ML	DF24B	ST PA1
371	Internal Doors	LEVEL 01	0353	1-296	CA-1415	820	2400 D3	T	PA2				F			DF24B	ST PA1
372	Internal Doors	LEVEL 01	0451	1-298	CA-1203	820	2400 D3	T	PA2					LS	ML	DF24B	ST PA1
373	Internal Doors	LEVEL 01	0151	1-239	CA-1203	860	2400 D1	T	PA2		+300/30	Rw27	F, AC, D	DL	ML		PA2
374	Internal Doors	LEVEL 01	0151	1-300	ES-1656	820	2400 D3	T	PA2		+300/30	Rw27	F, AC, D	DL	ML	DF24C	ST PA2
375	Delayed Procurement	LEVEL 01	0351	1-301	CF-1406	820	320 2670 D63	T	PA2		+300/30	Rw27	F, AC, D	DL	ML	END	DF1 3 PA2
376	Delayed Procurement	LEVEL 01	0352	1-302	CA-1436	820	320 2370 D65	F	PA2			Rw27	AC, D	DL	ML	AG Y DPS	ST PA2
377	Delayed Procurement	LEVEL 01	0352	1-303	CA-1436	820	320 2370 D65	F	PA2			Rw27	AC, D	DL	ML	AG Y DPS	ST PA2
378	Delayed Procurement	LEVEL 01	0353	1-304	CF-1413	820	320 2400 D65	F	PA2			Rw27	AC, D	DL	ML	AG Y DPS	ST PA2
379	Internal Doors	LEVEL 01	0451	1-305	CF-1413	820	320 2400 D65	F	PA2			Rw27	AC, D	DL	ML	AG Y DPS	ST PA2
380	Delayed Procurement	LEVEL 01	0452	1-306	CF-1618	820	320 2370 D65	F	PA2			Rw27	AC, D	DL	ML	AG Y DPS	ST PA2
381	Delayed Procurement	LEVEL 01	0353	1-307	CF-1448	820	320 2400 D65	F	PA1S			Rw27	AC, LS	ML	ML	AG Y DPS	ST PA1S
382	Internal Doors	LEVEL 01	0451	1-308	CF-1600	820	320 2400 D65	F	PA1S			Rw30	AC, LS	ML	ML	AG Y DPS	ST PA1S
383	Internal Doors	LEVEL 01	0453	1-309	CA-1203	860	2400 D1	F	PA2		+300/30	Rw27	F, AC, D	DL	ML	END	PA2
384	Internal Doors	LEVEL 01	0453	1-310	CA-1203	820	2400 D3	F	PA2		+300/30	F	LS	ML	DF24C	ST PA2	
385	Internal Doors	LEVEL 01	0153	1-313	CA-1036	860	2670 D3	T	PA2		+300/30	F	LS	ML	DF24C	ST PA2	
386	Internal Doors	LEVEL 01	0352	1-318	CA-1436	820	320 2400 D56	T	PA2			Rw27	AC, D	DL	ML	END	DF6
387	Internal Doors	LEVEL 01	0223	1-333	CF-1263	820	2400 D21B	F	PA2			Rw27	AC, D	DL	ML	NO	DPS
388	Delayed Procurement	LEVEL 01	0351	1-334	CA-1203	820	2400 D21B	F	PA2			Rw27	AC, D	DL	ML	NO	DPS
389	Internal Doors	LEVEL 01	0221	1-336	CA-1011	820	2350 D7	T	PA2			Rw27	AC, D	DL	ML	NO	DPS
390	Internal Doors	LEVEL 01	0453	1-337	CF-1636	820	320 2400 D52	T	PA2			Rw27	AC, D	DL	ML	NO	DPS
391	Internal Doors	LEVEL 01	0221	1-339	PP-1207	820	2350 D7	T	PA2			Rw27	AC, D	DL	ML	NO	DPS
392	Internal Doors	LEVEL 01	0221	1-340	CA-1204	820	2350 D7	T	PA2			Rw27	AC, D	DL	ML	NO	DPS
393	Internal Doors	LEVEL 01	0221	1-341	SO-1190	820	2350 D7	T	PA2			Rw27	AC, D	DL	ML	NO	DPS
394	Internal Doors	LEVEL 01	0221	1-342	PP-1095	820	2350 D7	T	PA2			Rw27	AC, D	DL	ML	NO	DPS

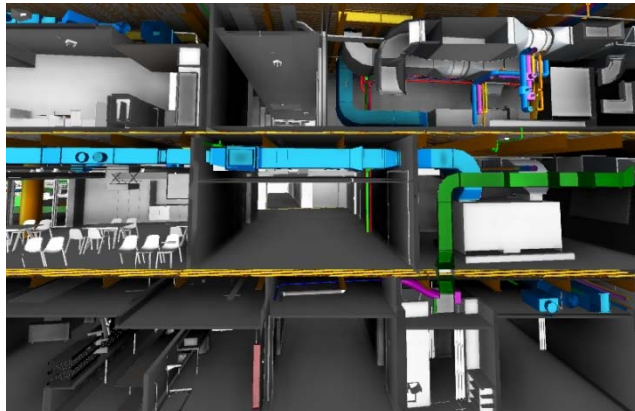




Facilities Management & Operator Benefits



- Transfer of asset information
- Quickly assessing issues with digital 3D context
- Easy facility navigation and information accessibility
- Operator preparation and increased project understanding

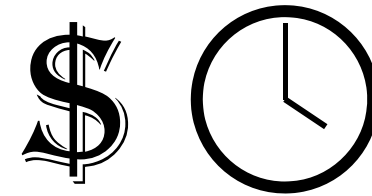




Perth Stadium BIM Hurdles

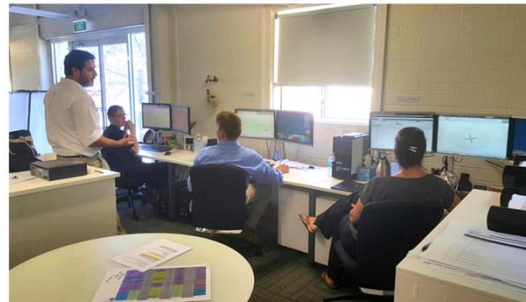
Sub-contracts & Scope

- Early scope definitions and deliverable timing
- Subcontractor pricing for the unknown



Training mid-project

- Time pressures



Change management

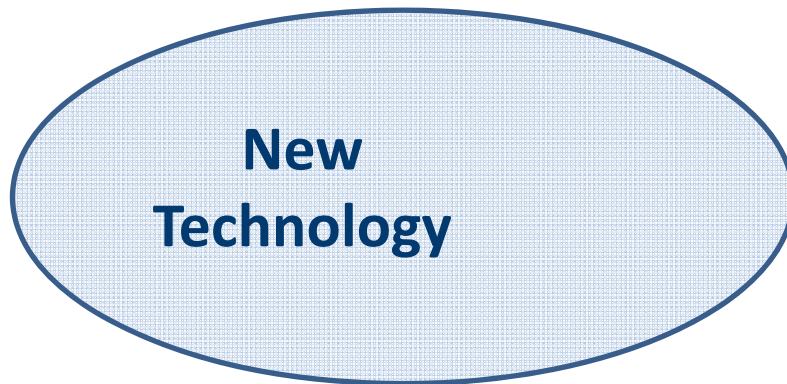
- Planning & implementation of the unknown





Finding the Middle Ground

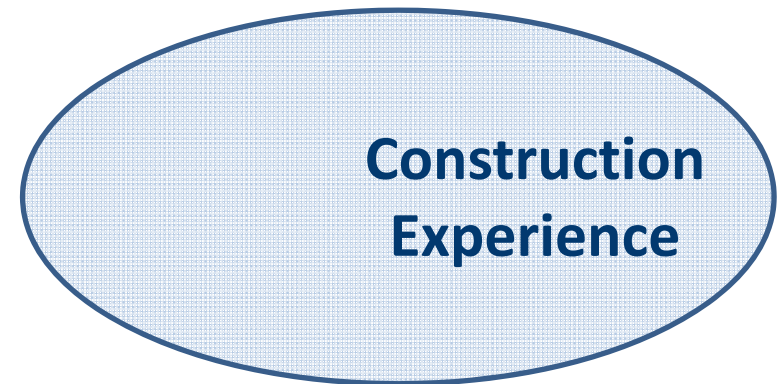
GRADUATES



**New
Technology**

**Effective
BIM**

SITE MANAGEMENT



**Construction
Experience**

Rapid change and adaption is normal

“How can I do this faster and with less manual work?”

“Can I get this on my mobile?”

“After years of experience, this is how it’s done best”

“I prefer printed plans”

Change must be planned and implemented carefully



BIM and the Information Age

BIM 'Utopia'

Big Software Packages

Revit

Archicad

Navisworks

Level 3 BIM

IFC

Tekla

BIM 360

Software limitations

Simple Data & Geometry

Sharing and accessibility of information

Cloud Storage

Dynamo

Google sheets

.xls & .csv

Flux

Bluebeam

Flexibility & adaptability

