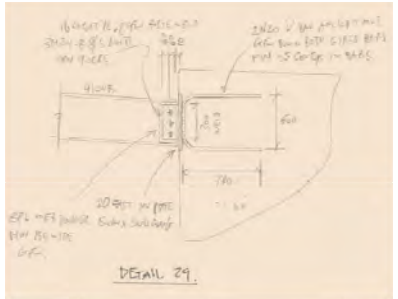
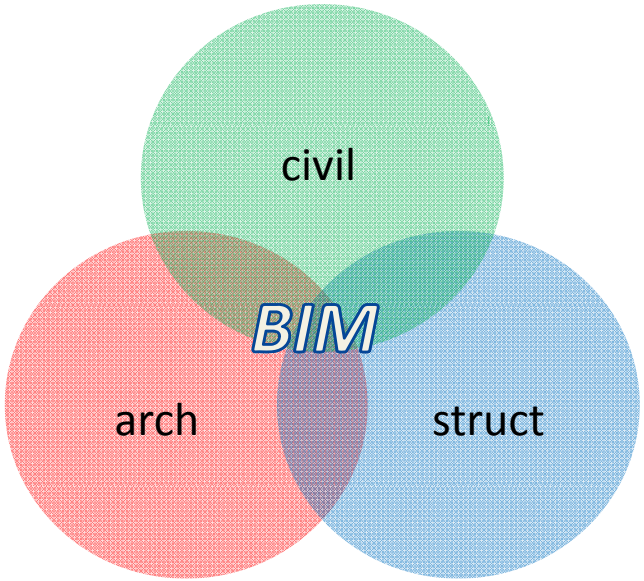


McVeigh

“Efficiency in the Steel Supply Chain”
Using BIM

The McVeigh Way: Core Values



help people to;

change the world whilst;

having fun and;

making money.

The McVeigh Way: The Tool

one single BIM model for architecture and structure leading to;

1. More effective communication
2. Higher degree of certainty
3. Faster design and documentation times
4. More efficient structural steel framing solutions
5. **Smarter subcontract procurement methods**
6. **Faster steel supply chain delivery methods**

My background: I'm not a modeler

My background

PROCESSES &
WORKFLOWS

the *"what if?"* question…..

realisation that the **steel supply chain** is the **achilles heel** of the majority of developments, especially in the **industrial and retail sectors**

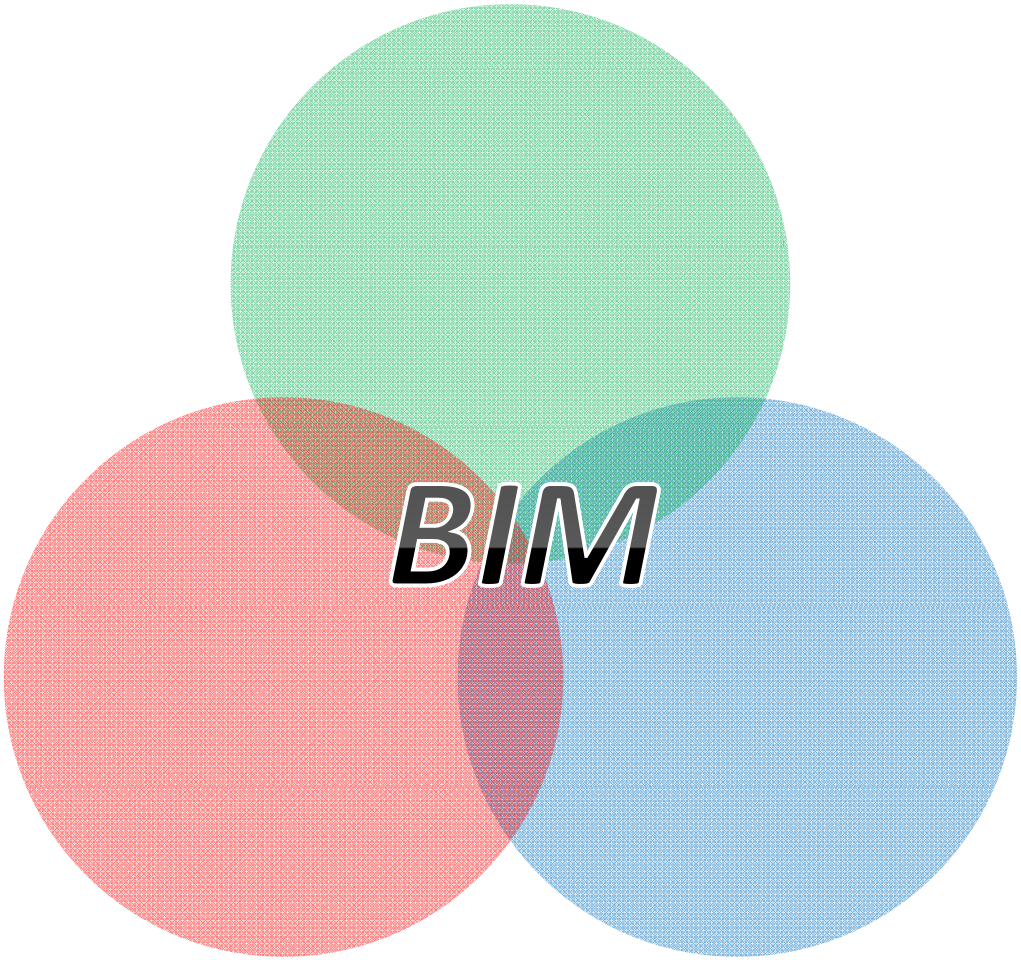
So we started asking the **what if** question. What if we had absolutely no constraints; wouldn't it be great if we could _____?

ADCO

SD STEELCAD DRAFTING PTY LTD
Specialising in Materials Handling and Structural Steel Shop Detailing

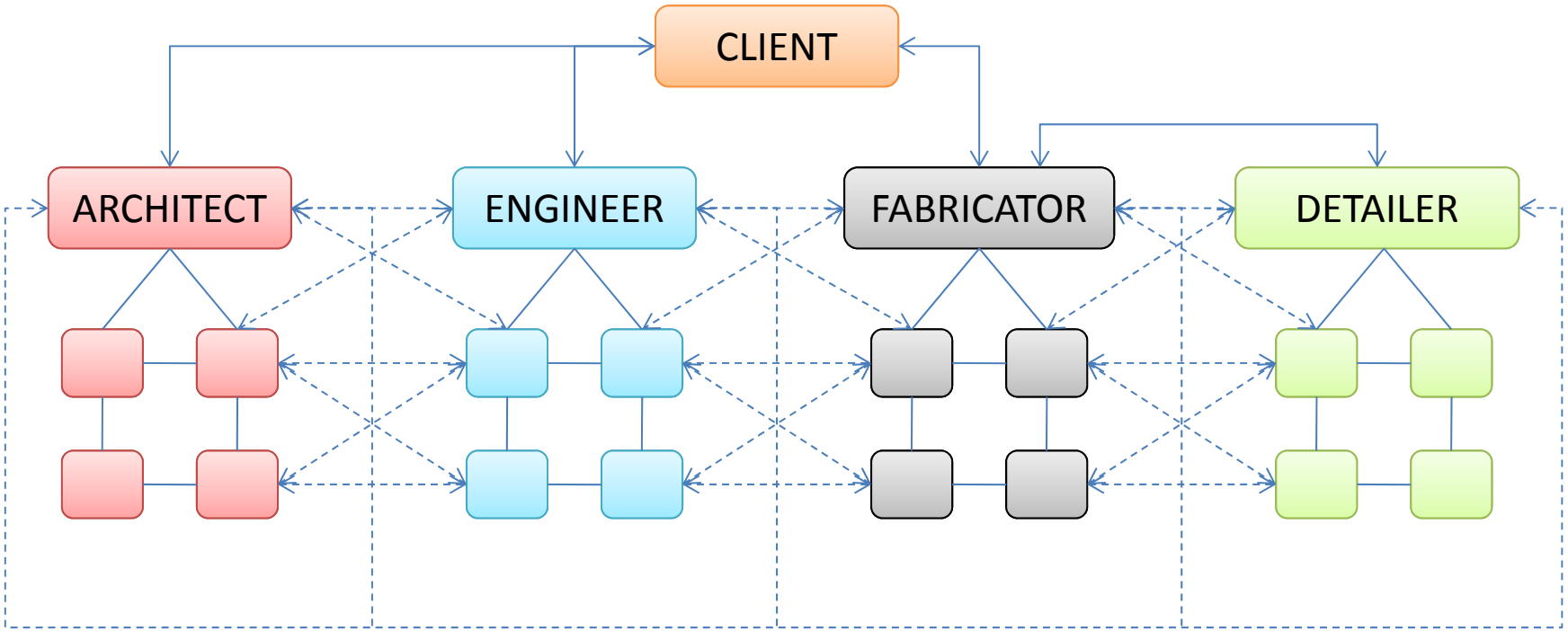
B&L STEEL

So, using the McVeigh Way



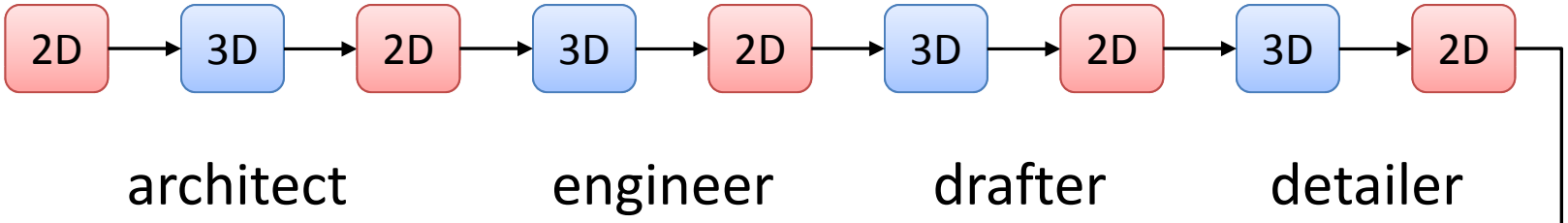
McVeigh

how did we revolutionise the traditional workflow of the steel supply chain



McVeigh

and revolutionalise the traditional transfer of information



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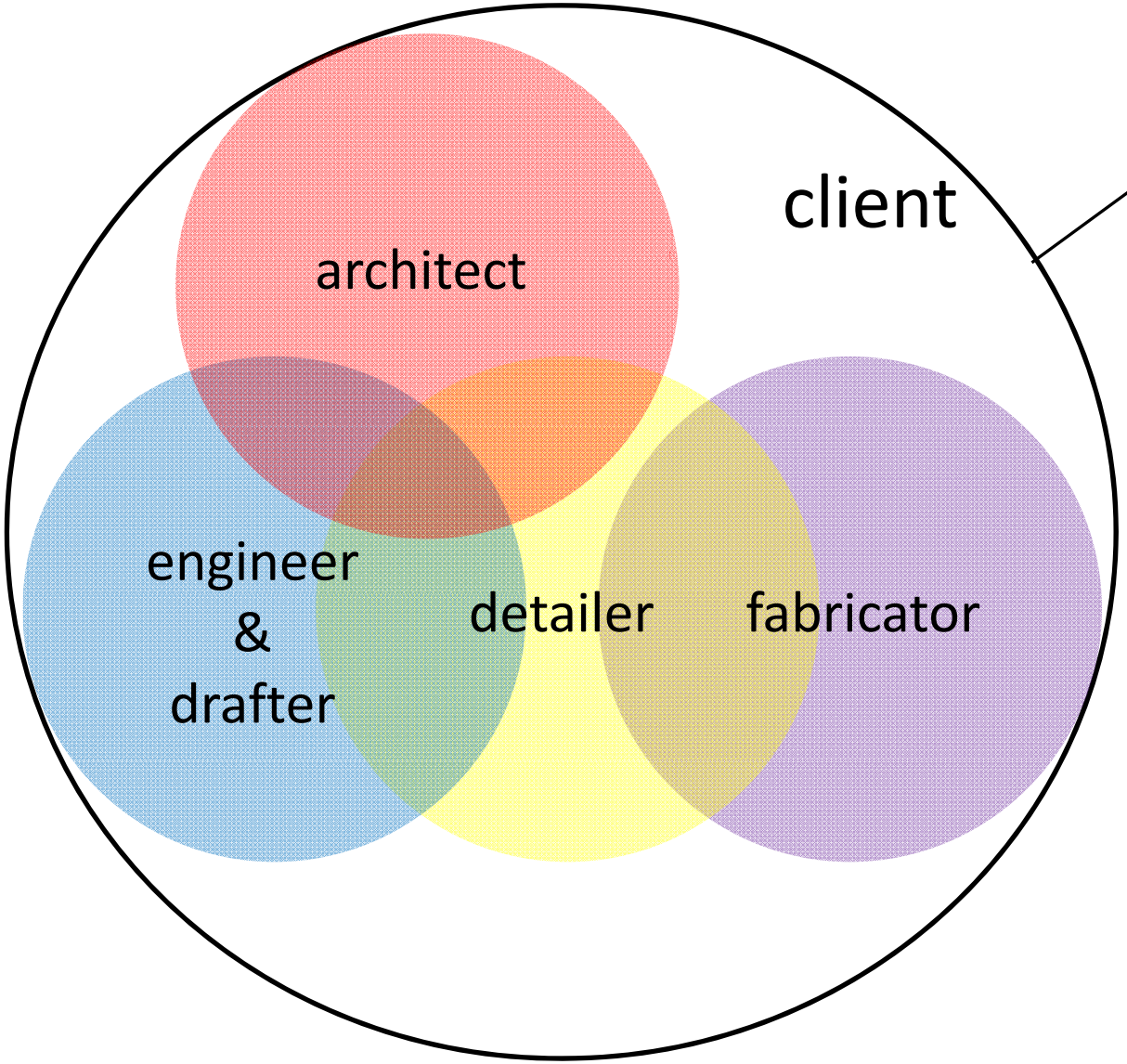
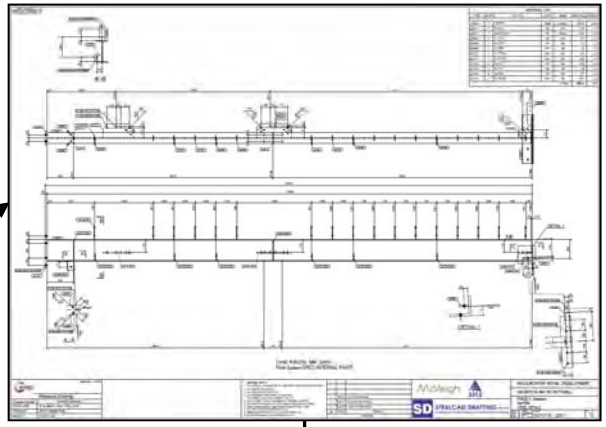
Answer: by working under a BIM focused IPD structure integrated project delivery





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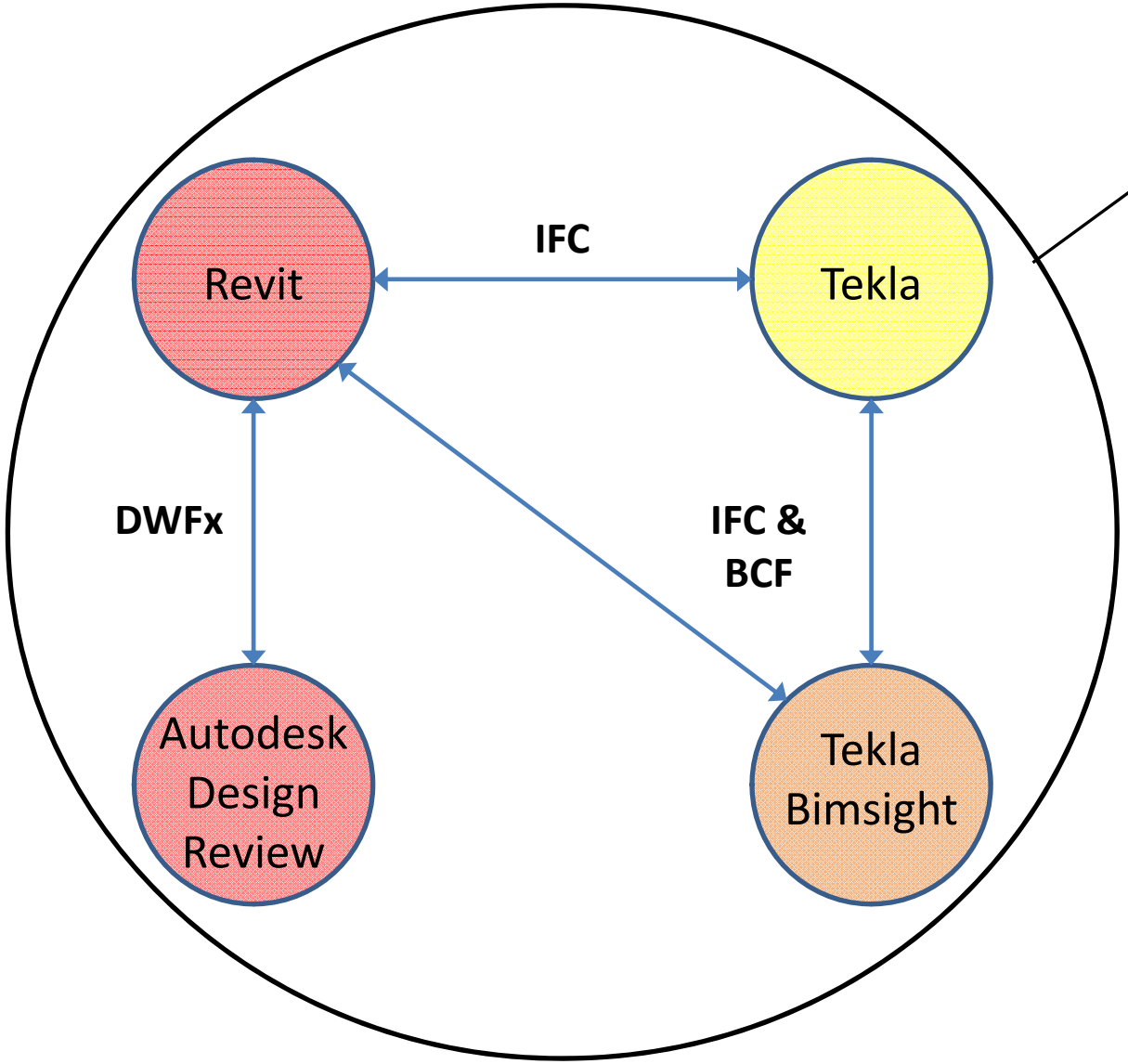
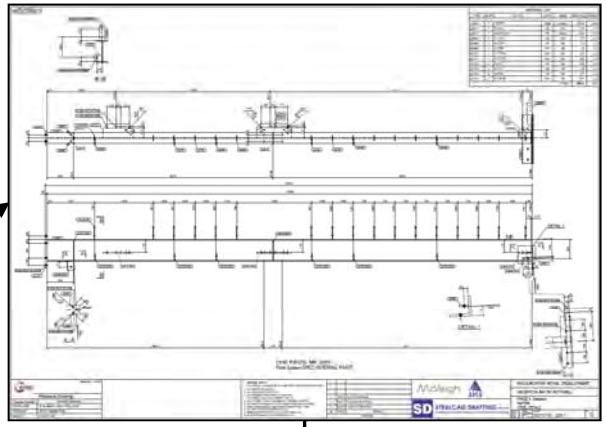
how does the 3D transfer of information look?





McVeigh

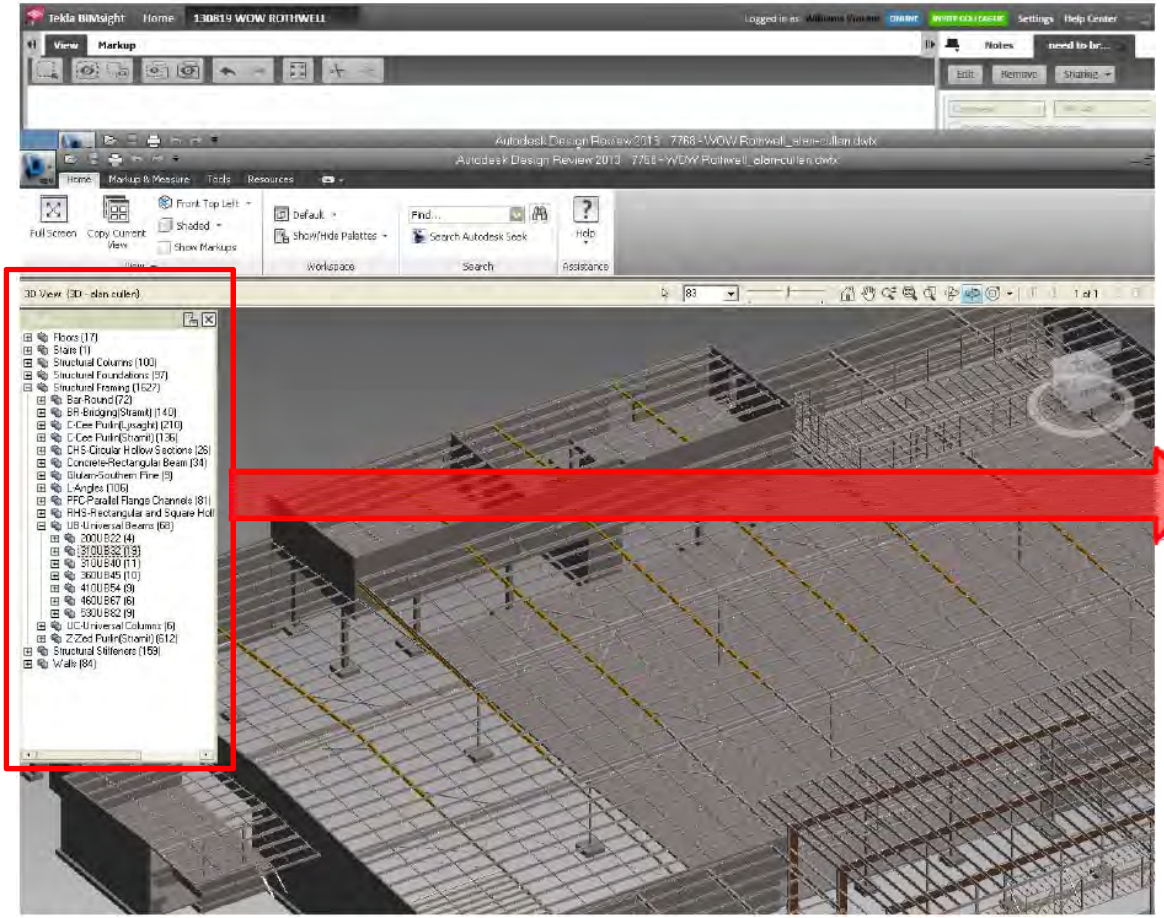
A real world example – Woolworths Rothwell

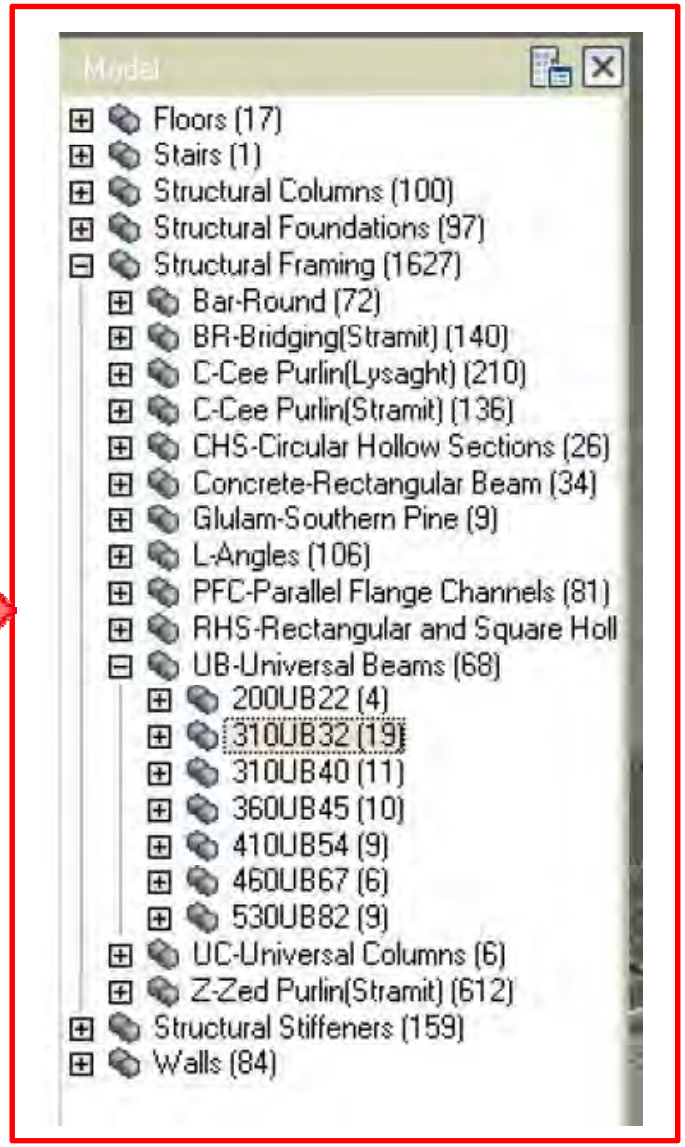
- 5,500m2 store including 10 specialty stores
- 100t structural steel contract
- ADCO D&C contract
- CNN Architects
- McVeigh Structural Engineers
- SteelCAD Steel Detailers
- Alltype Welding Fabricators

Woolworths

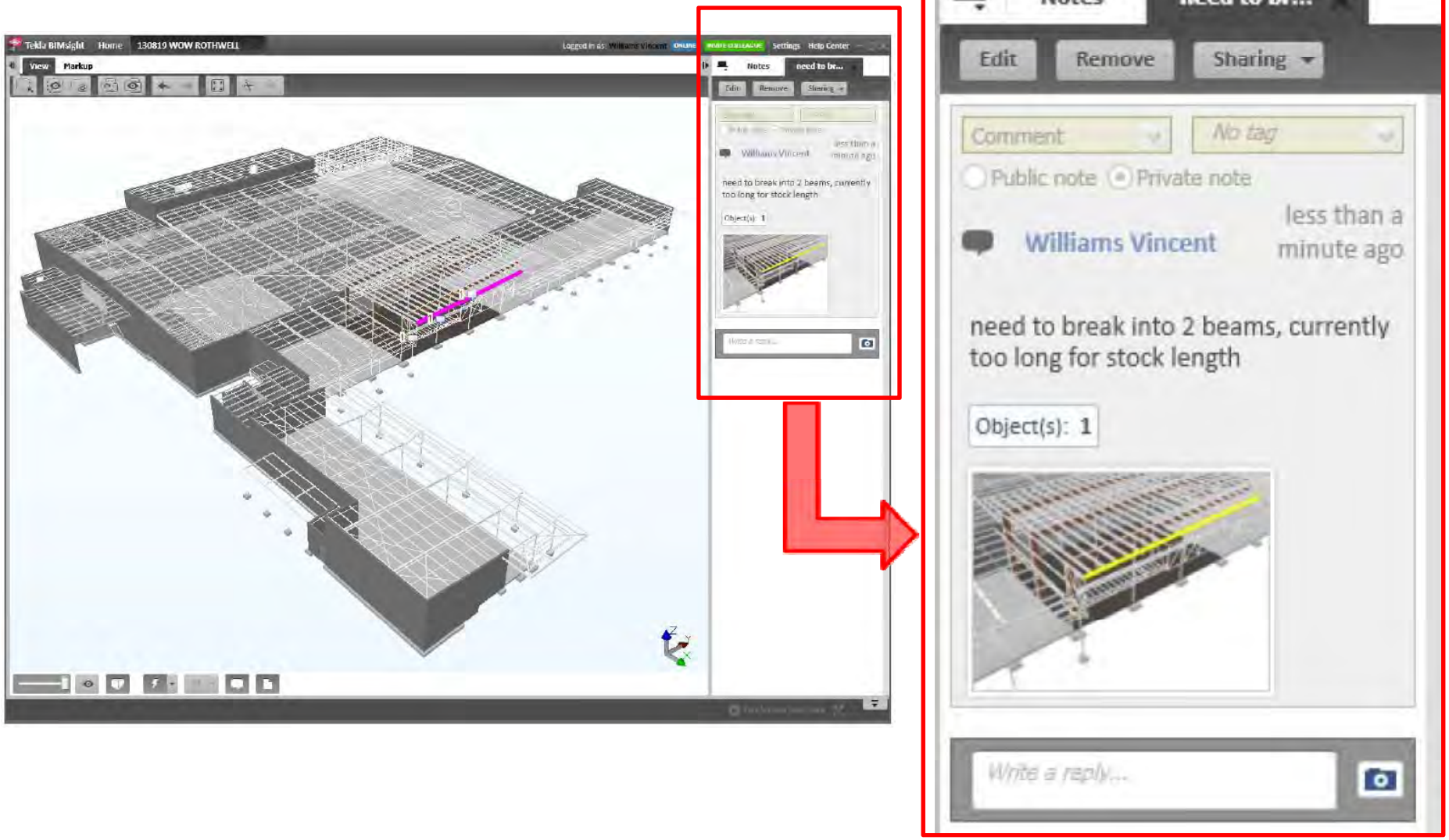
McVeigh

in house QA reviews all performed in 3D – Autodesk Design Review (DWFx files)

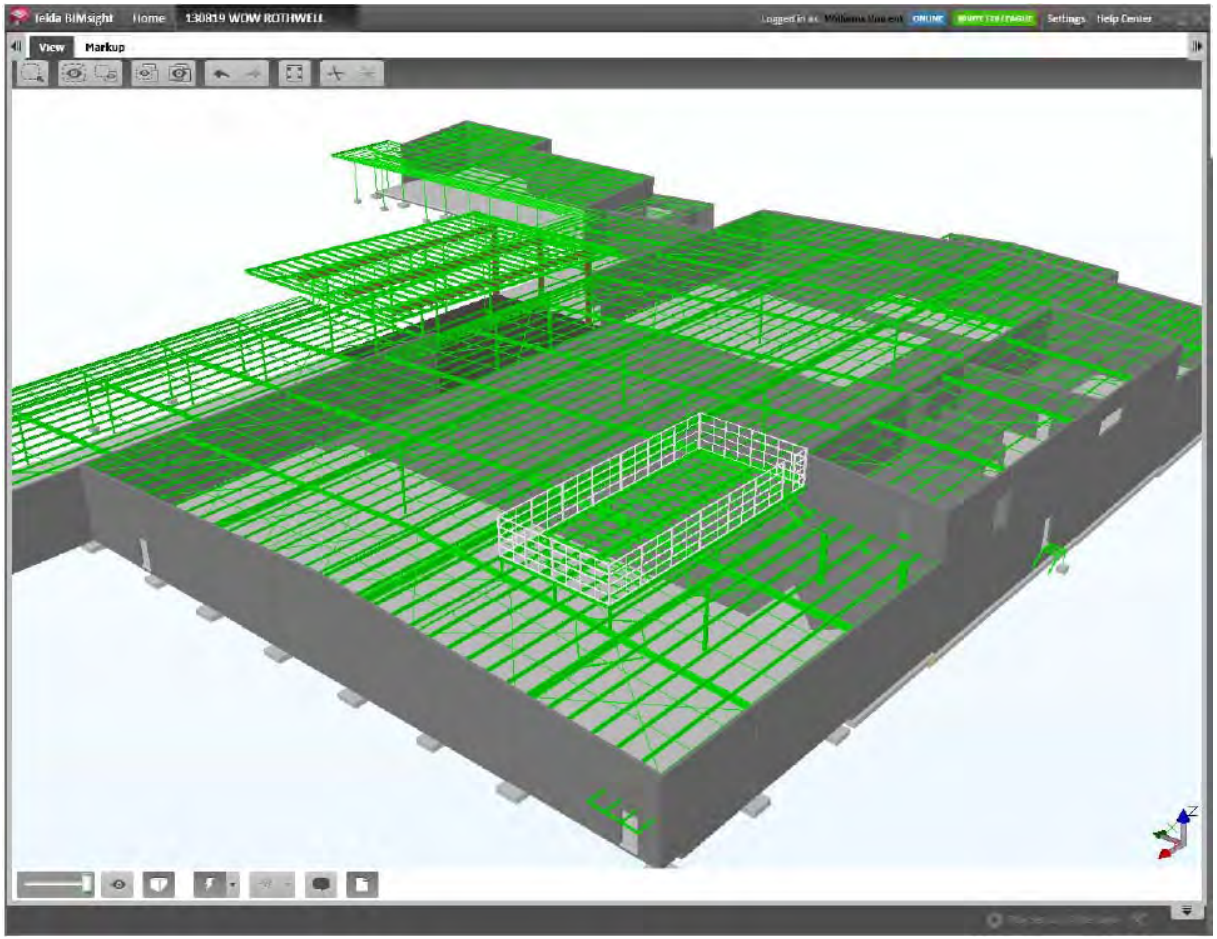




in house QA reviews all performed in 3D - TeklaBIMsight (IFC to BCF files)



IFC(A) model transferred from engineer to detailer

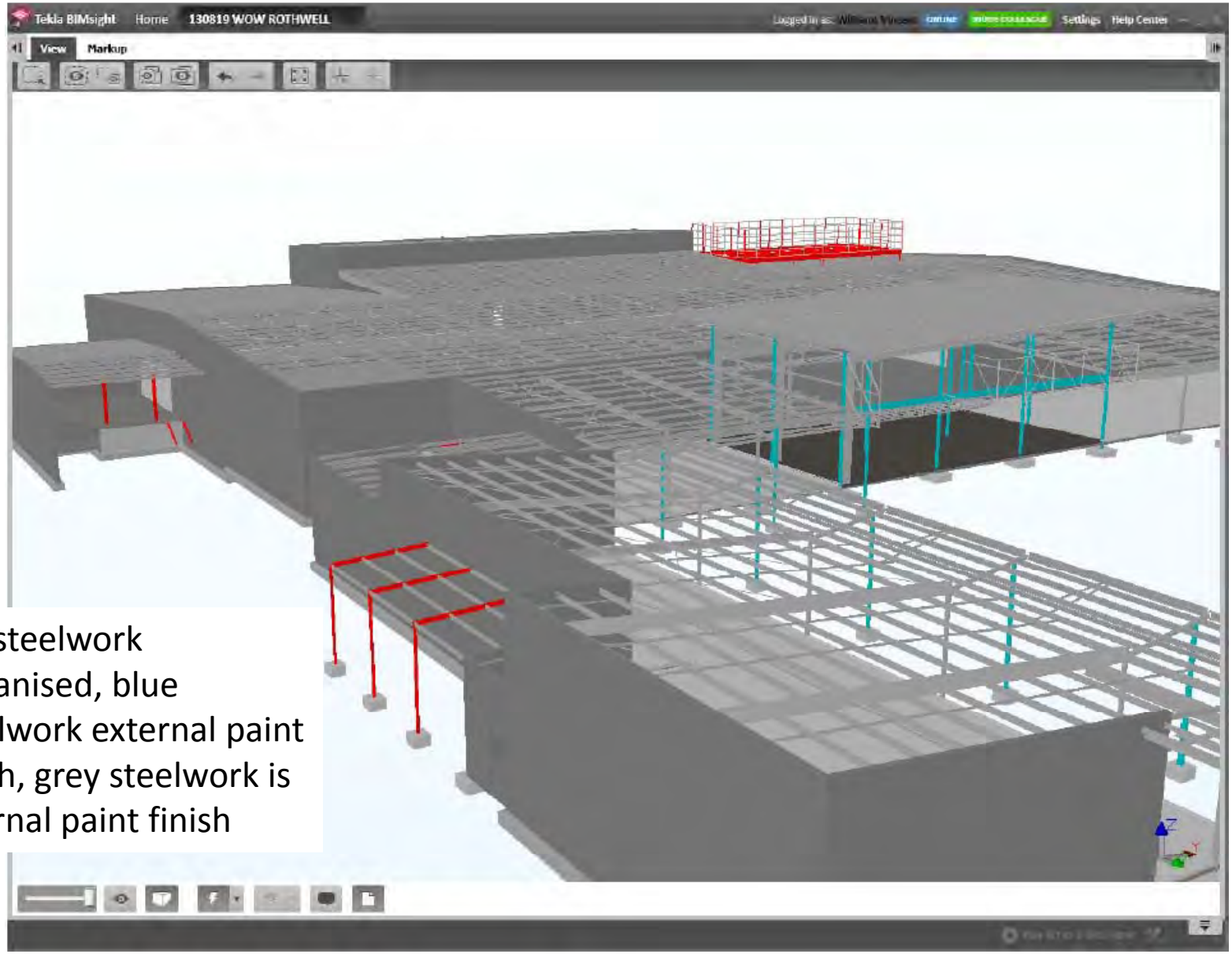


- point to point model
- member placement guaranteed
- 100% of the steelwork is modelled including:
  - Purlins
  - Flybraces
  - Bridging
  - etc
- Attributes embedded include
  1. Approval status
  2. Surface finish
  3. Preset information
  4. Detail references

green steelwork is approved for detailing, grey is yet to be approved

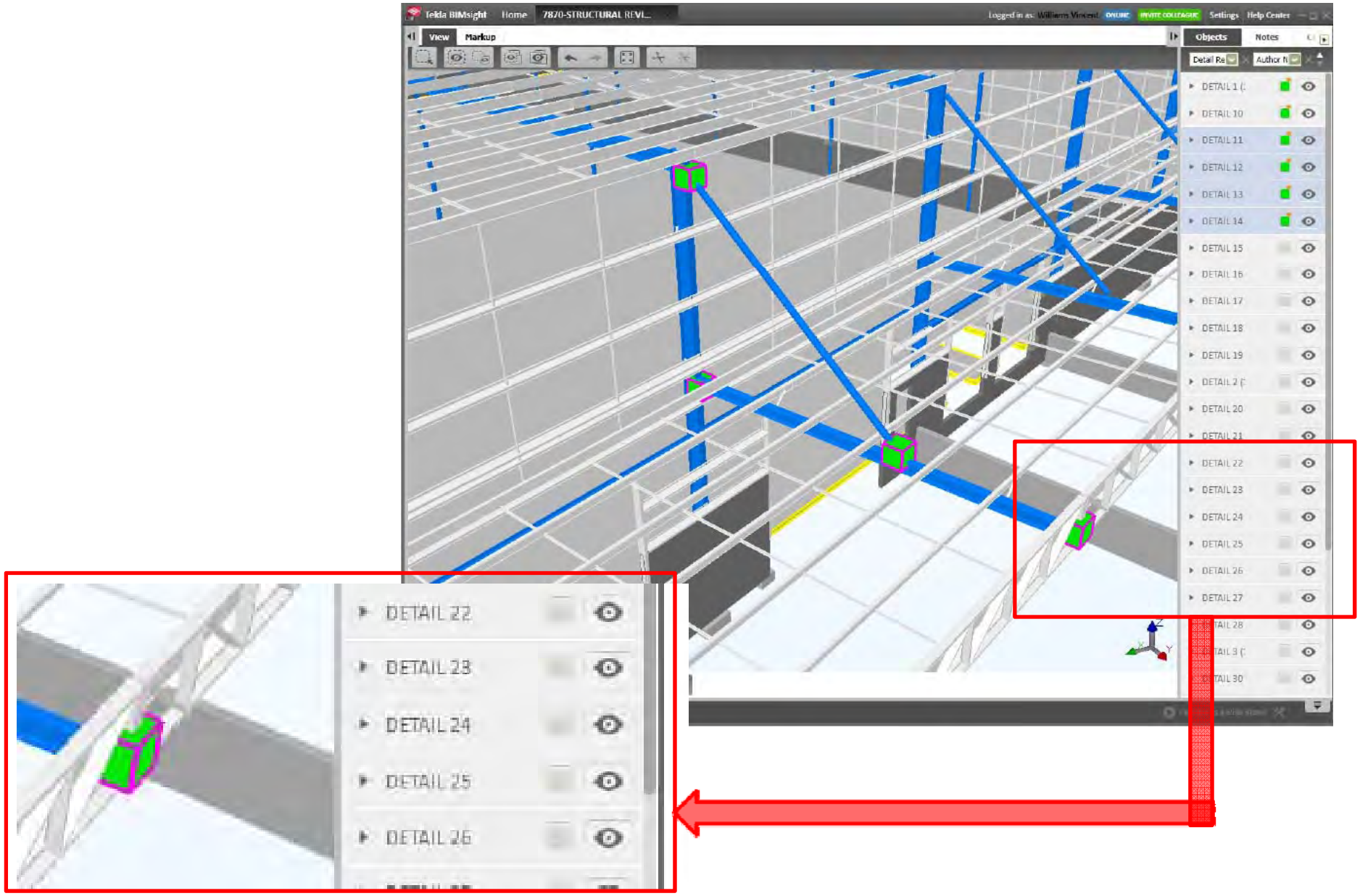
McVeigh

IFC(A) model transferred from engineer to detailer



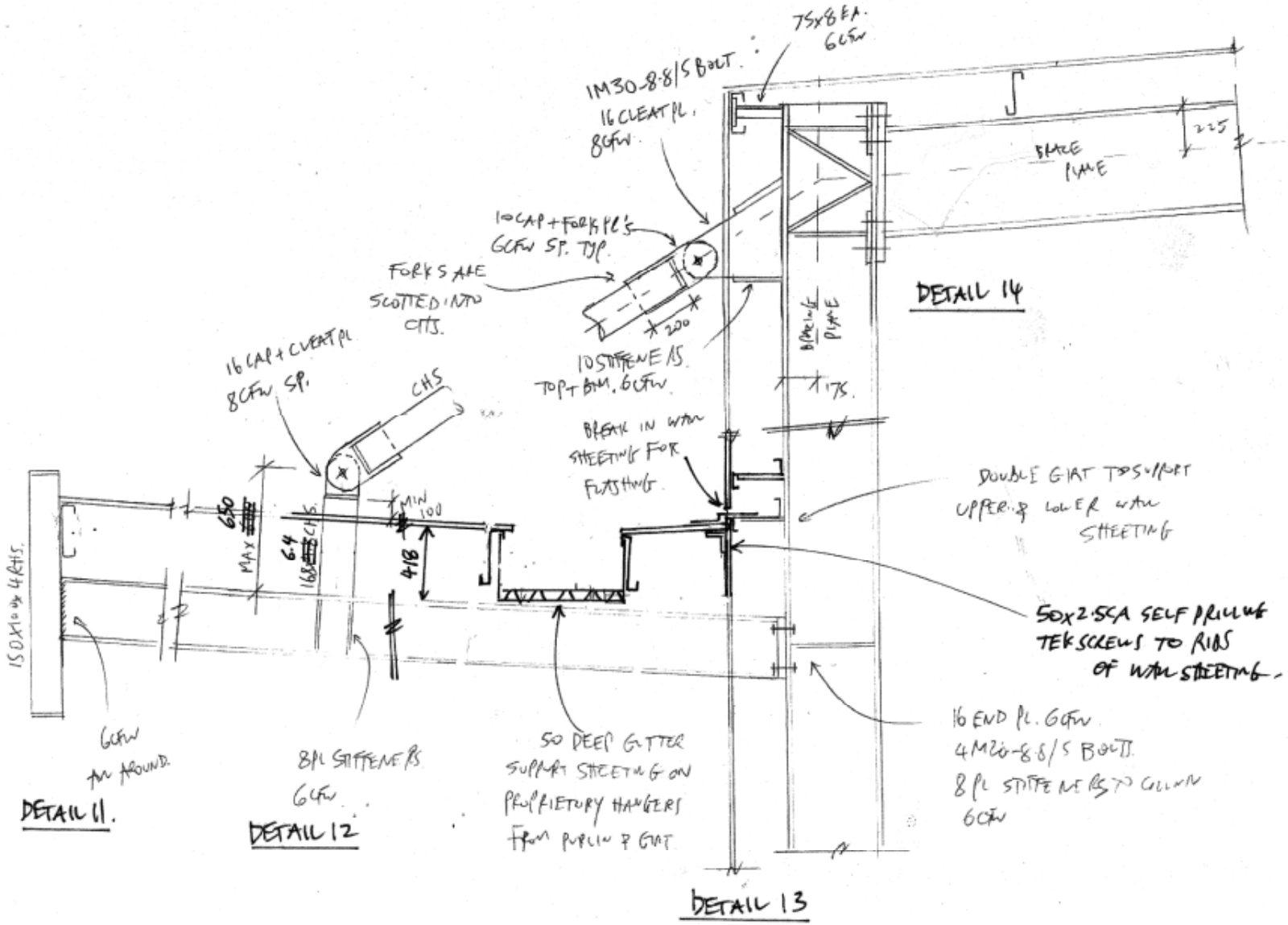
red steelwork galvanised, blue steelwork external paint finish, grey steelwork is internal paint finish

IFC(A) model transferred from engineer to detailer

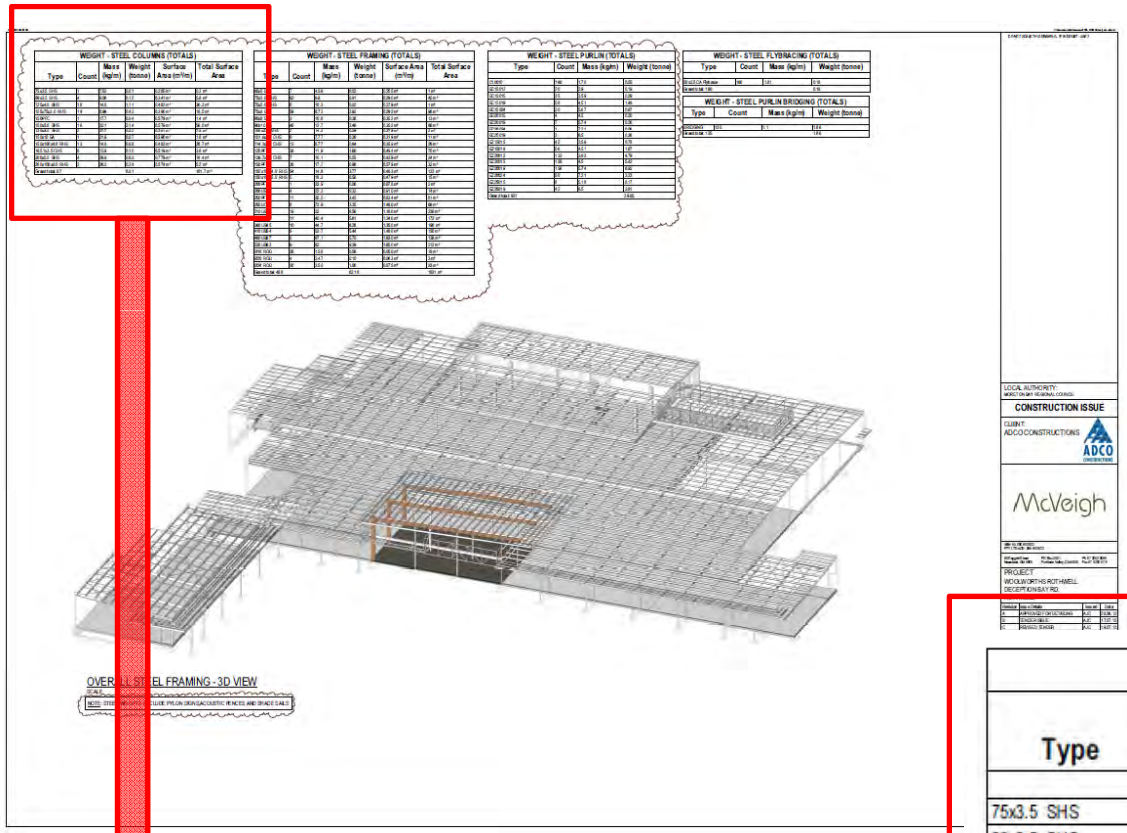


McVeigh

sketched details transferred engineer to detailer



summary steelwork schedules issued to fabricator for early procurement



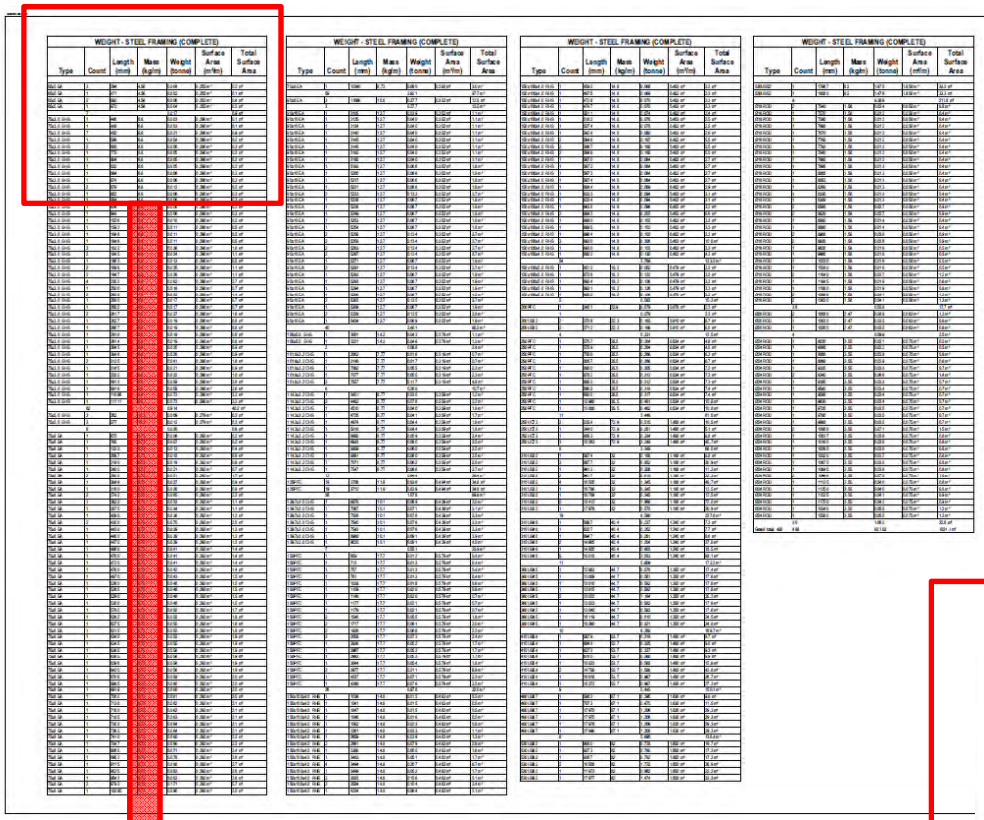
1. Provides certainty
2. Reduces scaling errors
3. Provides more time to procure steelwork

Resulting in 5% better steelwork sub-contractor prices

WEIGHT - STEEL COLUMNS (TOTALS)

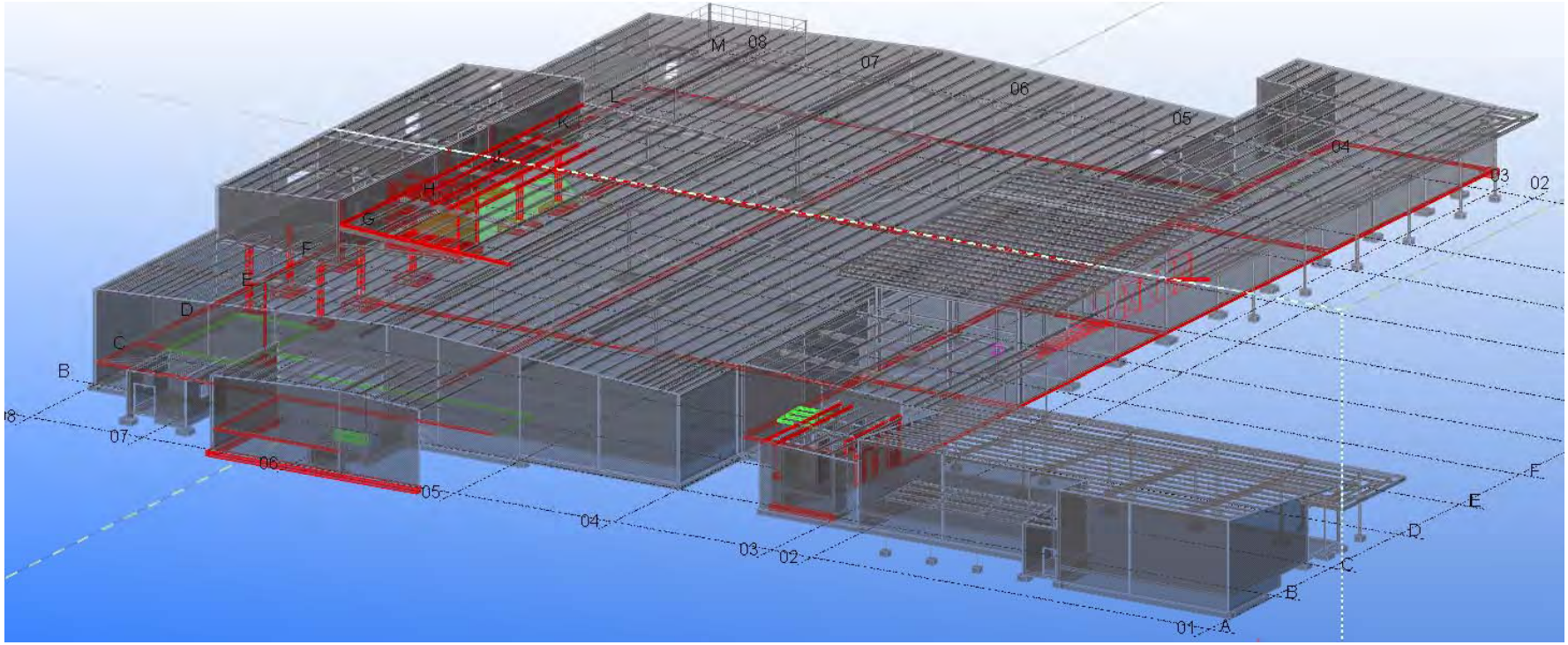
Type	Count	Mass (kg/m)	Weight (tonne)	Surface Area (m^2/m)	Total Surface Area
75x3.5 SHS	1	7.53	0.01	0.285 m^2	0.3 m^2
89x3.5 SHS	4	9.06	0.15	0.341 m^2	5.8 m^2
125x4.0 SHS	18	14.8	1.11	0.483 m^2	36.2 m^2
125x75x3.0 RHS	19	8.96	0.43	0.390 m^2	18.5 m^2
150PFC	1	17.7	0.04	0.579 m^2	1.4 m^2
150x5.0 SHS	16	22.1	2.14	0.579 m^2	56.0 m^2
150x9.0 SHS	2	37.7	0.52	0.561 m^2	7.8 m^2
150x10 EA	1	21.9	0.07	0.590 m^2	1.8 m^2
150x100x4.0 RHS	13	14.8	0.88	0.483 m^2	28.7 m^2
165.1x3.5 CHS	6	13.9	0.10	0.519 m^2	3.8 m^2
200x5.0 SHS	4	29.9	0.63	0.779 m^2	16.4 m^2
200x100x6.0 RHS	2	26.2	0.24	0.574 m^2	5.2 m^2
Grand total: 87			6.31		181.7 m^2

detailed steelwork schedules issued to fabricator for early procurement



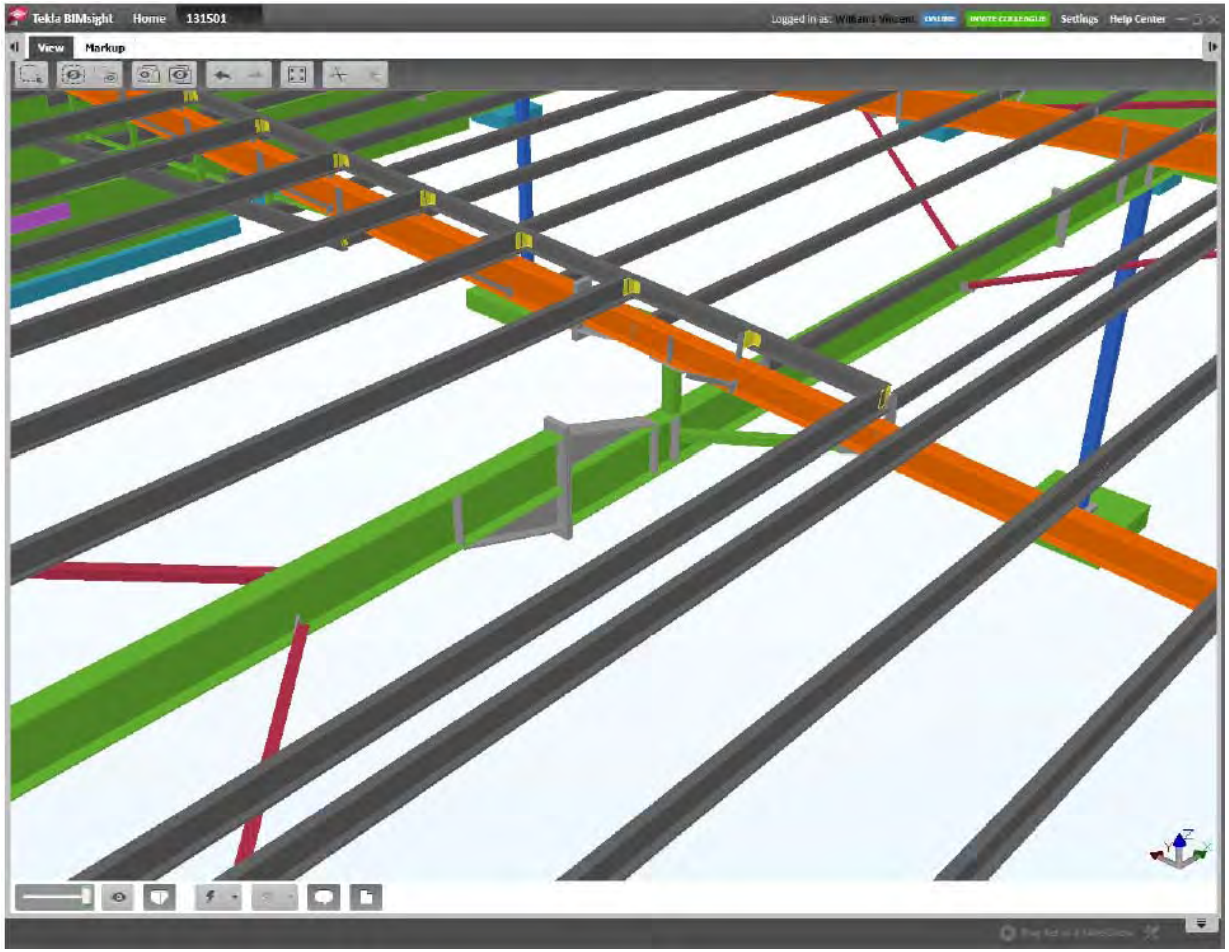
WEIGHT - STEEL FRAMING (COMPLETE)						
Type	Count	Length (mm)	Mass (kg/m)	Weight (tonne)	Surface Area (m²/m)	Total Surface Area
530UB82	1	17987	82	1.475	1.850 m²	33.3 m²
530UB82	1	18000	82	1.476	1.850 m²	33.3 m²
	9			9.389		211.8 m²
Ø16 ROD	2	7540	1.58	0.024	0.050 m²	0.8 m²
Ø16 ROD	1	7570	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7580	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7660	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7670	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7760	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7792	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7840	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7860	1.58	0.012	0.050 m²	0.4 m²
Ø16 ROD	1	7995	1.58	0.013	0.050 m²	0.4 m²
Ø16 ROD	1	8000	1.58	0.013	0.050 m²	0.4 m²

IFC(B) model transferred from engineer to detailer



- red steelwork has changed from rev A to rev B issue
- green steelwork is completely new from rev A to rev B

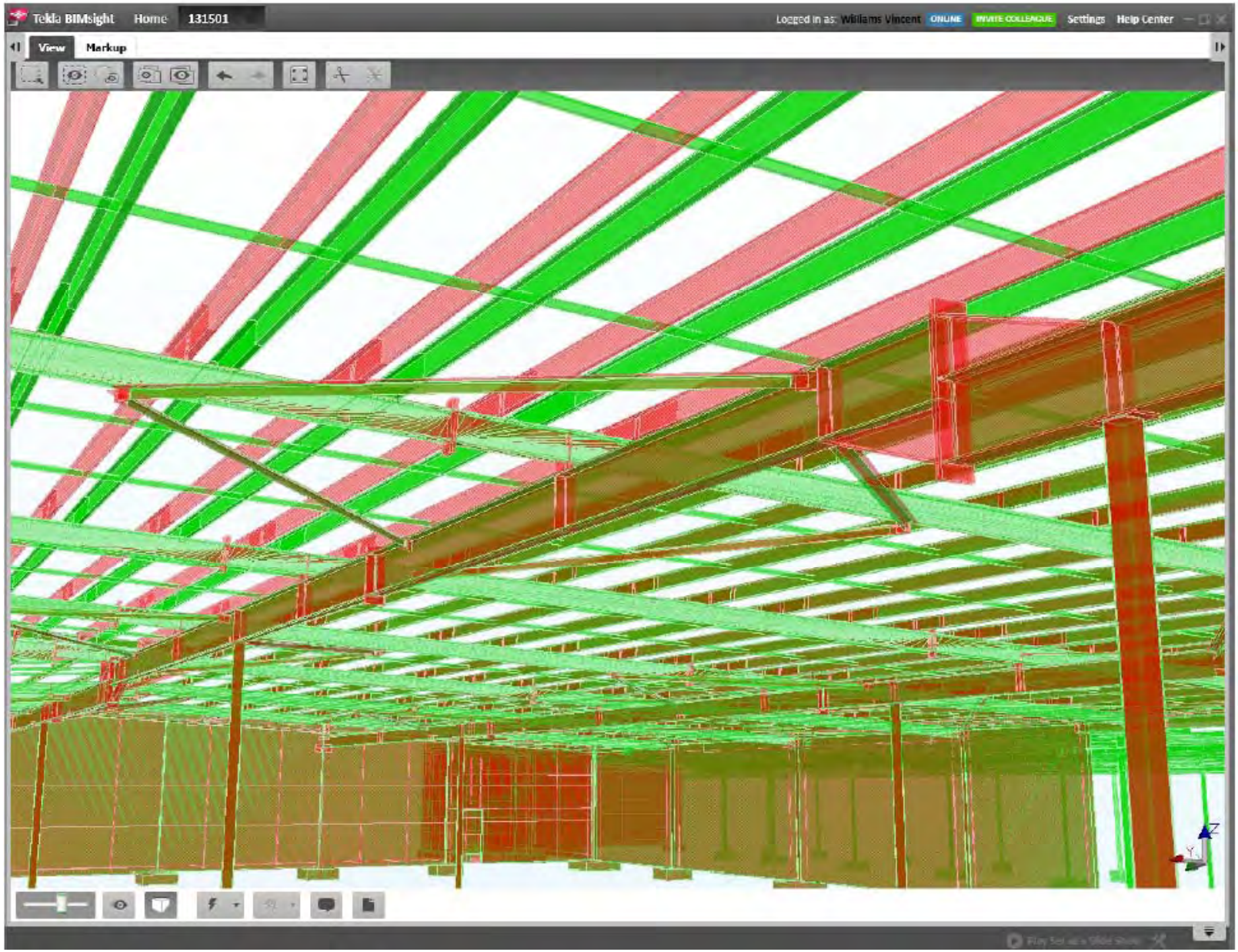
IFC(a) transferred from detailer to engineer



Coordination between detailers, engineering and architectural model occurs in 3D in Tekla BIMsight with simple overlays

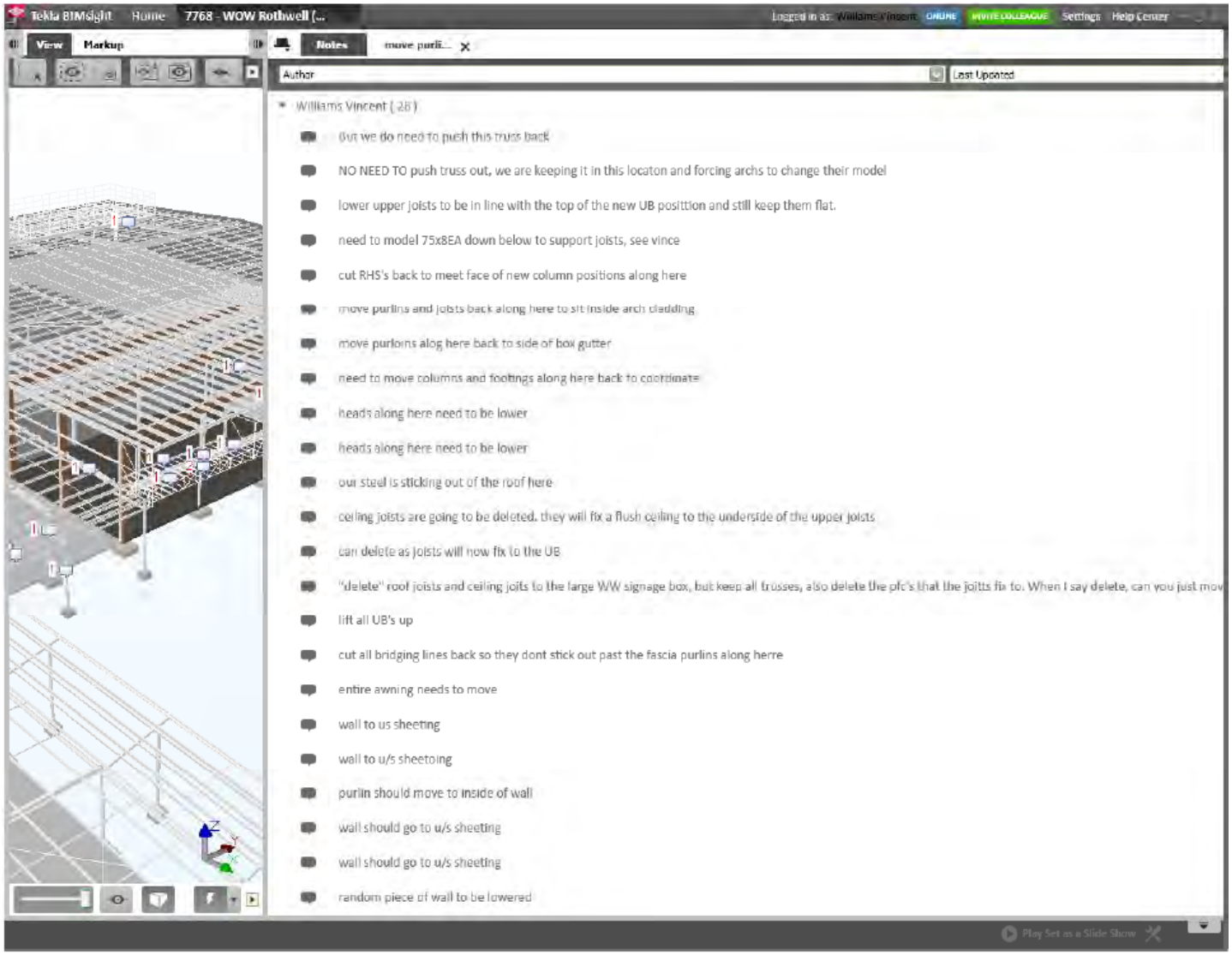
- Full geometry review
- Member size review
- Connection size review
- Surface finish review

IFC(a) transferred from detailer to engineer



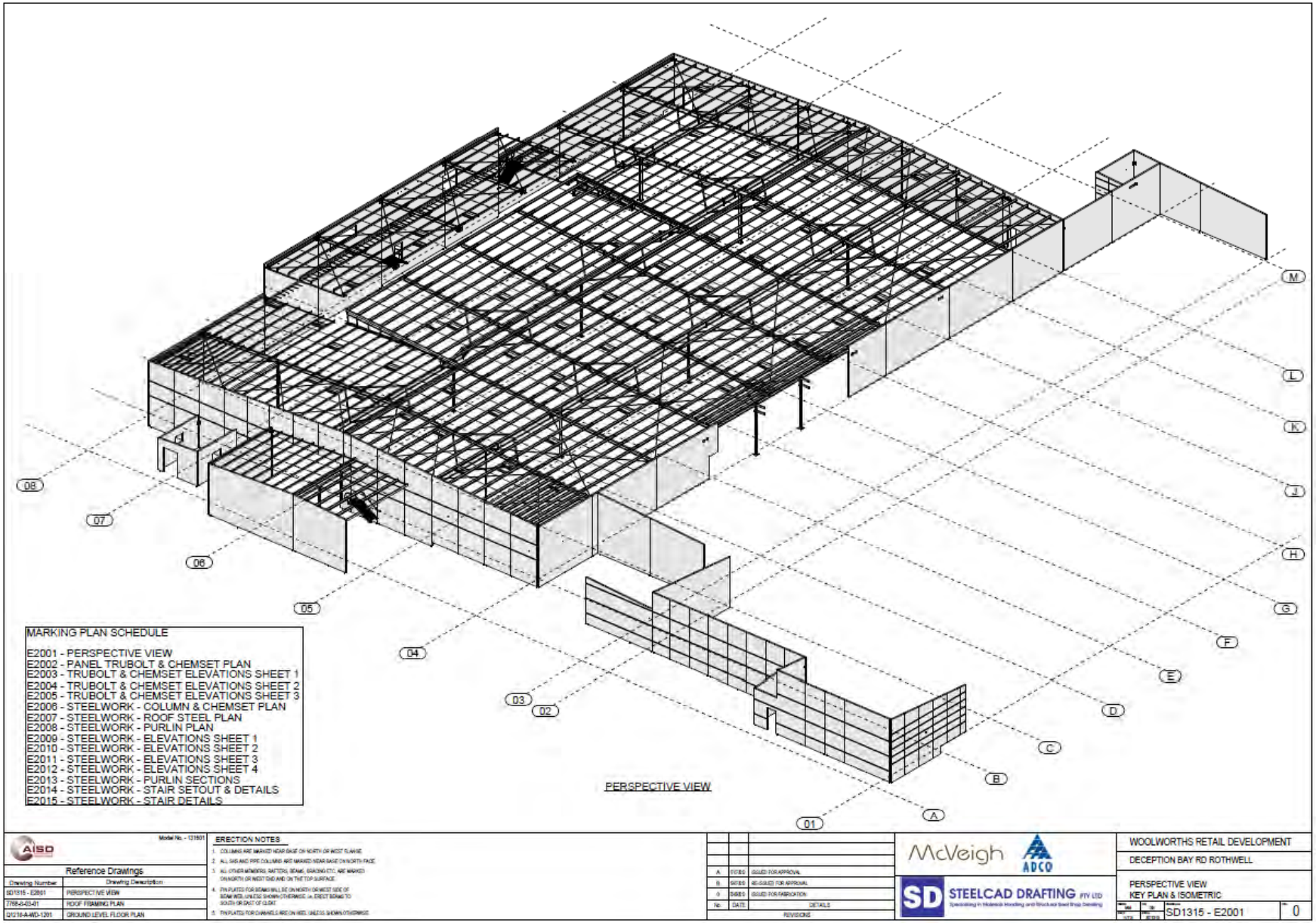
McVeigh

BCF(A) comment file transferred from engineer to detailer



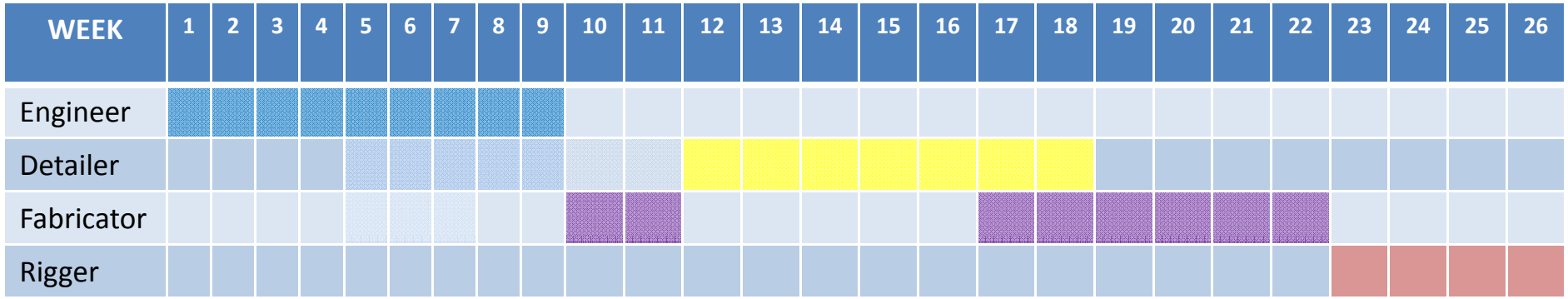
IFC(b) transfer from detailer to engineer for final review and approval

detailer produces shop drawings

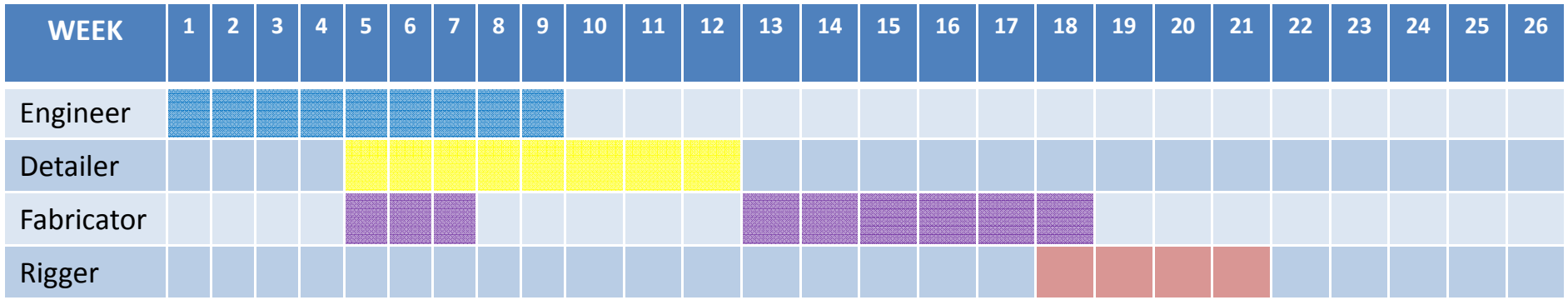


And the result?

Proposed program under a traditional workflow



Actual program under the IPD workflow



- 5 week saving to the steel supply chain
- 3 week saving to the critical program
- 3 week saving to the preliminaries budget, **$45,000**
- 5% saving to the steel sub-contract, **$30,000**
- adding 3 additional weeks to earn margins on other projects, **$45,000**
- TOTALLING a 1.5% saving to construction costs

And the feedback?

Brendan Meikle, Design Manager for ADCO

- *"**IPD delivery** method has proven to guide the design and shop drawing process to **manage risk and produce accurate drawings** to build whilst affording ADCO **more time to negotiate subcontracts** to meet budget targets"*
- *"has allowed us to **meet a fast tracked program** and **meet target budgets** with the comfort of knowing the **construction documentation is of the highest quality**. If we had of followed a conventional method I am confident to say that this would have put our on site structure activities approx **2-3 weeks** behind schedule, with a higher risk of inaccurate construction drawings which would lead to expensive on site added costs"*
- *"**IPD** has certainly been proven to **save time on programme** and provide better opportunity to meet fast tracked programmes **with minimal risk**. It has **provided certainty** that procurement will meet milestones and **lower trade costs** due to the accuracy of quantities. The building industry is forever evolving and IPD is a delivery method which is proven to **provide value to our deign and construct delivery methods**"*

And the feedback?

Jaron Schubert, Estimator from B&L steel said

- *"IFC model method gives us a **40% time saving in estimating** the job"*
- *"this (method) has provided us the ability to gain accurate tonnage measurements with the **elimination of direct scale inaccuracies**"*
- *"the ability to navigate through the model enables the erecting team to provide real-time lifting methods therefore **eliminating unnecessary additional costs for equipment and working platforms**"*

McVeigh

What's the recipe for success?

1. Get the **right people** on your IPD team
2. **Leave your ego**'s at the door
3. **Accurate** "preliminary" **designs** within IFC procurement model
4. **Guarantee your model** geometry, no more disclaimers
5. Ensure all **information transfer** is **controlled**
6. **Take** some **liability** for your mistakes

What's next for McVeigh and IPD?

Active projects in the pipeline with an IPD agreement

- Drive Industrial Estate
  - 900t, 45,000m2 of speculative warehouse
  - ADCO D&C Client
  - Forecasting $600k saving using IPD

Proposal projects currently in the market

- Woolworths Meadowbrook
  - 6,500m2 retail plus 2,500m2 commercial
  - ADCO D&C Client

- ALDI Distribution Centre
  - 50,000m2 warehouse and cold store
  - ADCO D&C Client

Any Questions?

McVeigh

People adding value