# BIM and Metadata

**Why metadata is relevant to product suppliers**

# BIM is here

- BIM is becoming widely adopted in commercial construction

- Most NZ houses are designed with BIM capable software

## BIM is:

- Creating a 3D model of objects that represents real world construction

- Using this model to make decisions and resolve issues
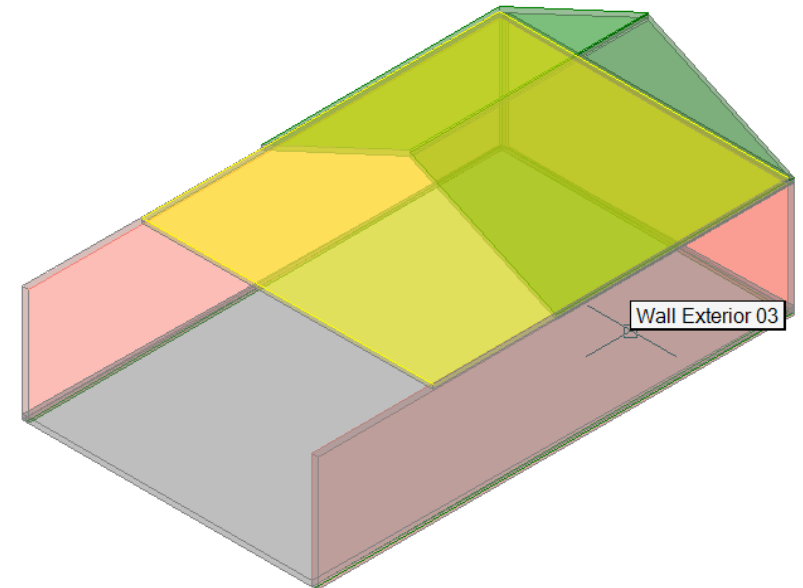
# What makes a BIM?

Two main types of objects:

**System** – walls, floors, roof, ceiling

System objects use geometry provided by the BIM system

Can save versions with your naming

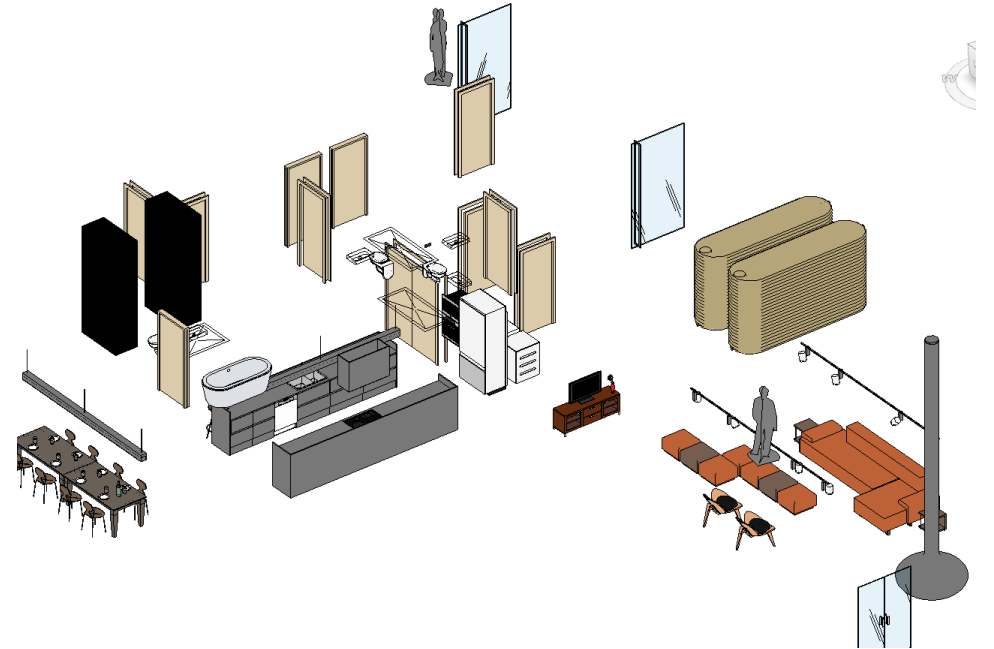Main value is metadata.



Wall Exterior 03

# What makes a BIM?

Two main types of objects:

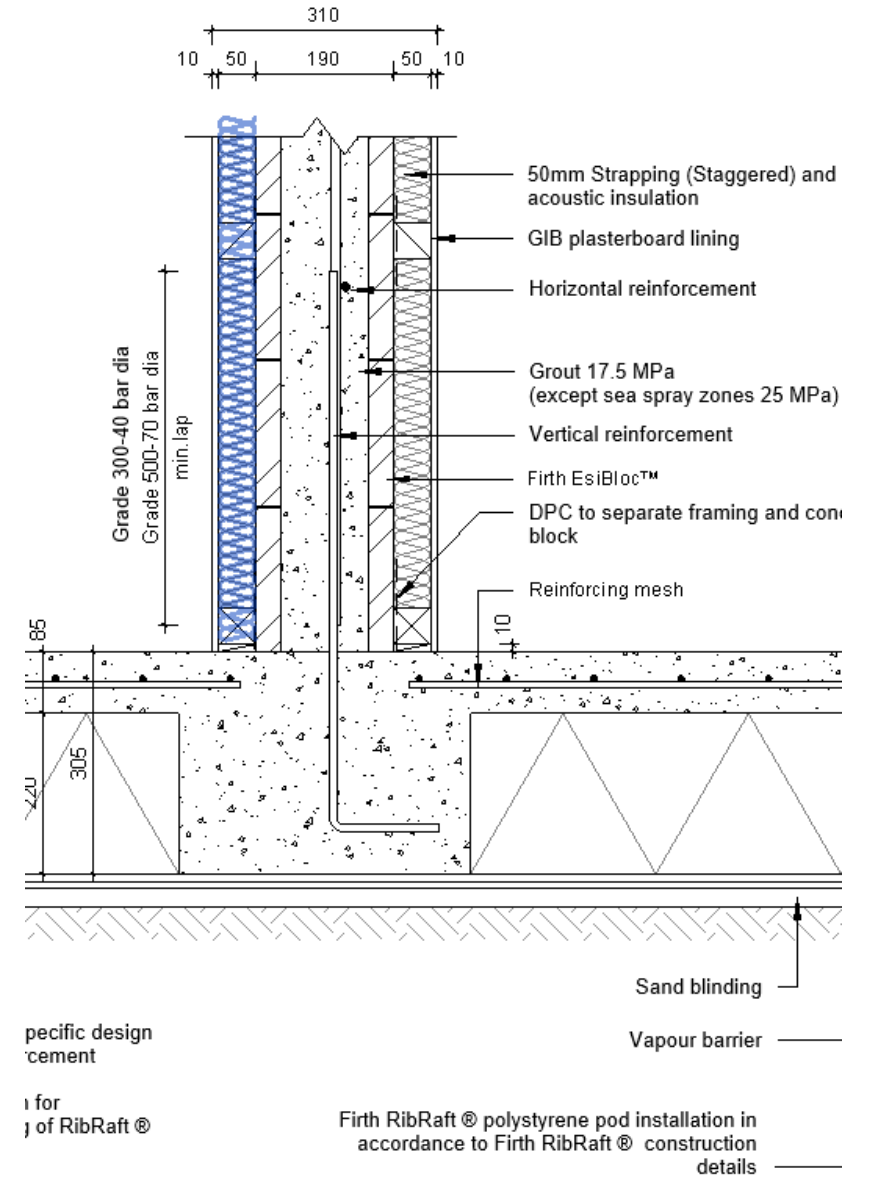**Component** or Loadable Objects – appliances, taps, fittings.

Component Objects require object geometry and metadata.

Allows products to be as visually accurate as needed.

# And 2D details for BIM

- For the designer to communicate construction details to builder, council, etc as drawings

- Should cover the most commonly used situations

- BIM 2D details allow for intelligence like linked keynotes

- Can use "dumb" CAD drawings, best to use native 2D objects in BIM authoring tool



50mm Strapping (Staggered) and acoustic insulation

GIB plasterboard lining

Horizontal reinforcement

Grout 17.5 MPa (except sea spray zones 25 MPa)

Vertical reinforcement

Firth EsiBloc™

DPC to separate framing and concrete block

Reinforcing mesh

Sand blinding

Vapour barrier

Firth RibRaft ® polystyrene pod installation in accordance to Firth RibRaft ® construction details

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# So what does this mean for suppliers?

**You can't ignore BIM**

- The current need is BIM compatible 2D details

    - Revit if you are mostly commercial

    - ArchiCAD if you are most residential

    - Ideally both

- You also need 3D objects to represent your products

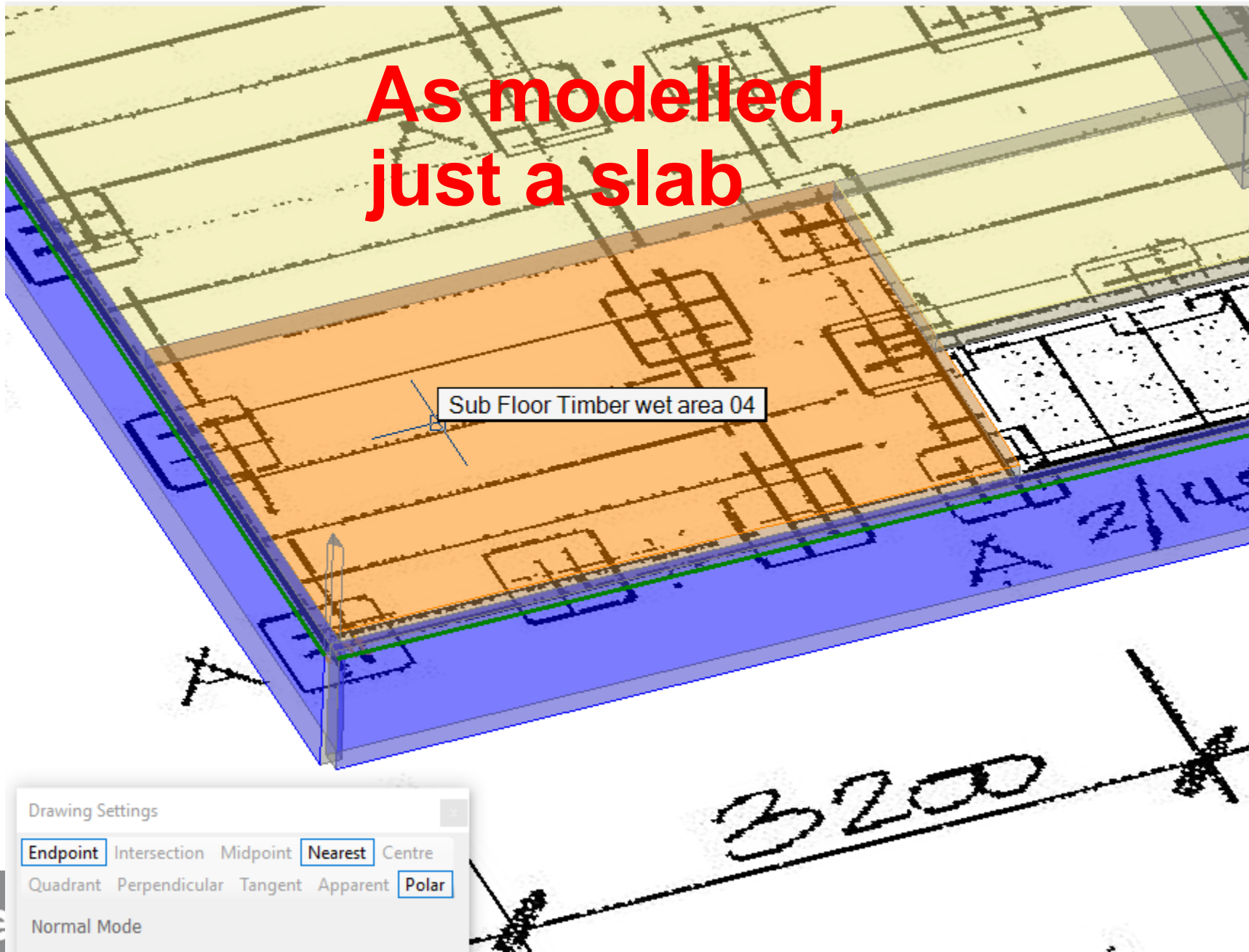- Effective metadata an important part in next wave of benefits

# What is metadata?

- It is information added to the objects in the BIM model

- Generally as materials and properties (also called parameters or attributes)

- Provides additional information about the object that can be included in schedules or extracted from the model
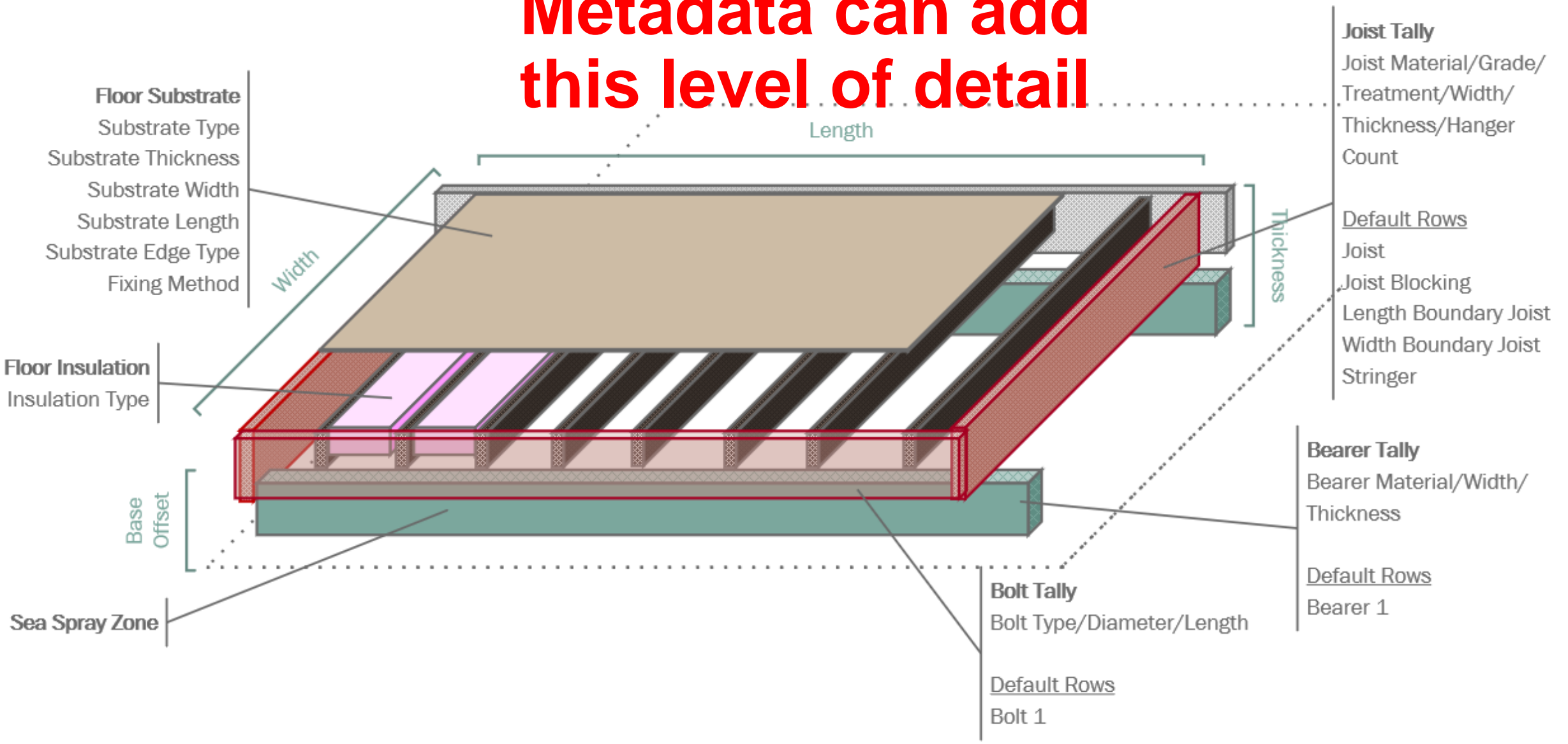
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As modelled, just a slab

Sub Floor Timber wet area 04

3200

Drawing Settings

Endpoint | Intersection | Midpoint | Nearest | Centre

Quadrant | Perpendicular | Tangent | Apparent | Polar

Normal Mode

**Metadata can add this level of detail**

Floor Substrate
- Substrate Type
- Substrate Thickness
- Substrate Width
- Substrate Length
- Substrate Edge Type
- Fixing Method

Width

Length

Floor Insulation
- Insulation Type

Base Offset

Sea Spray Zone

Thickness

Joist Tally
- Joist Material/Grade/
- Treatment/Width/
- Thickness/Hanger
- Count

Default Rows
- Joist
- Joist Blocking
- Length Boundary Joist
- Width Boundary Joist
- Stringer

Bearer Tally
- Bearer Material/Width/
- Thickness

Default Rows
- Bearer 1

Bolt Tally
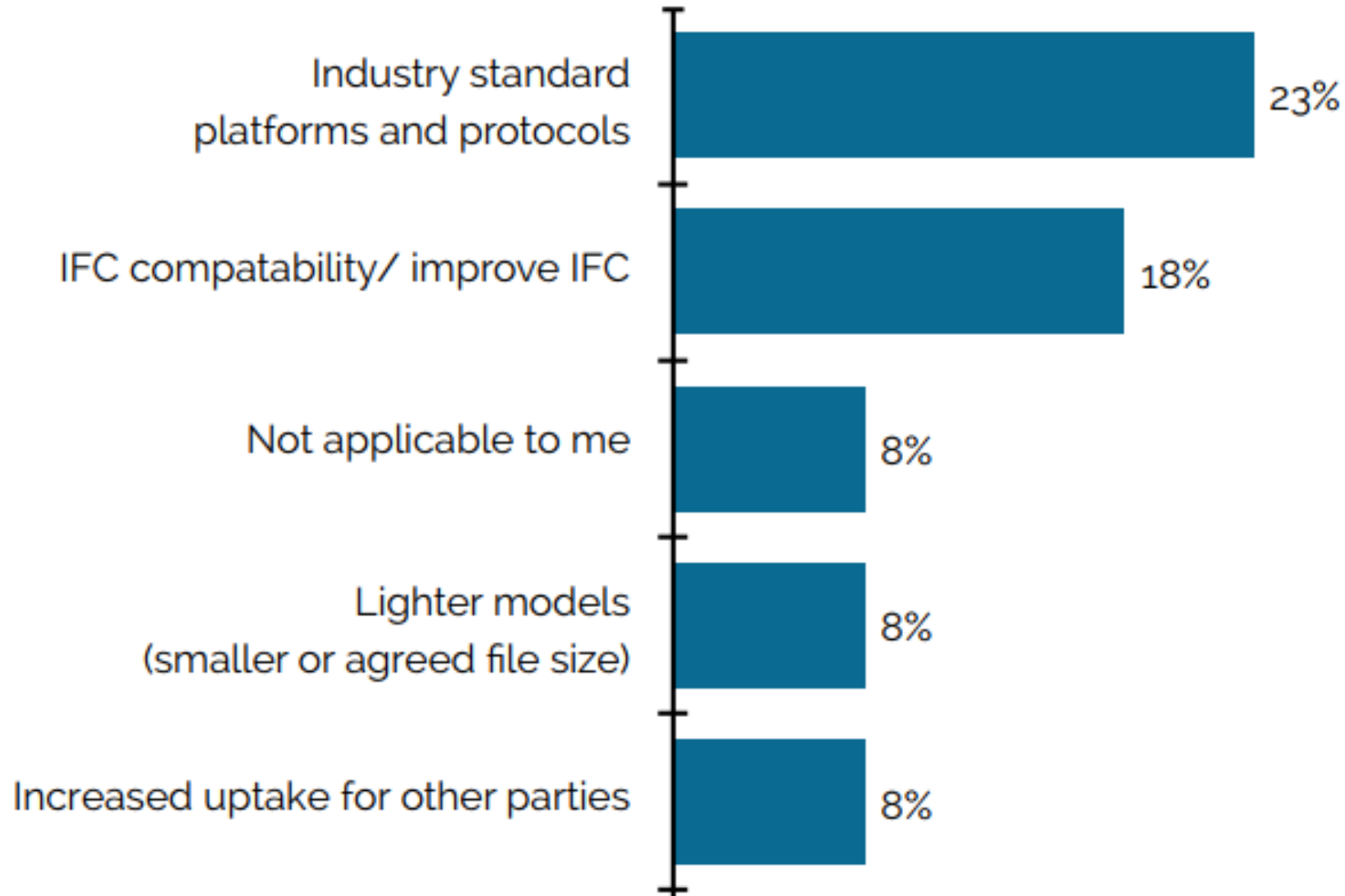- Bolt Type/Diameter/Length

Default Rows
- Bolt 1

# Why have a standard?

- Metadata is being used already

- Facilities management systems need it

- Estimators need it

- Each organisation is determining their own standard

- Duplicated effort

**Providing product data to a standard means users can use it straight off**

# Why have a standard?



**Industry standard platforms and protocols** — 23%

**IFC compatability/ improve IFC** — 18%

**Not applicable to me** — 8%

**Lighter models (smaller or agreed file size)** — 8%

**Increased uptake for other parties** — 8%

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# International BIM Object standard (IBOS)

Standard looks to guide BIM object developers with

- Standard metadata requirements

- Naming conventions for metadata, materials, objects, images.

- Guidance on object minimum quality standards


- Initiative championed by NATSPEC in Australia, Masterspec in NZ and the NBS in the UK

- Draft available on Masterspec website

- New release coming to have same core metadata requirements

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## Type Properties

| | | |
|---|---|---|
| Family: | System Family: Basic Wall | Load... |
| Type: | 4261_WallExt_70BrkFirth®Avonstone_140BlkConc15SSldFld | Duplicate... |
| | | Rename... |

### Type Parameters

| Parameter | Value | = |
|---|---|---|
| **Construction** | | ⌄ |
| **Graphics** | | ⌄ |
| **Materials and Finishes** | | ⌄ |
| **Analytical Properties** | | ⌄ |
| **Identity Data** | | ⌃ |
| Type Image | | |
| Keynote | | |
| Model | | |
| Manufacturer | Firth Industries | |
| Type Comments | | |
| URL | www.firth.co.nz | |
| Description | Brick_Firth®_Avonstone® | |
| Assembly Description | | |
| Assembly Code | | |
| Type Mark | | |
| Fire Rating | | |
| Cost | | |
| **General** | | ⌃ |
| CBICode | 4261 | |
| CBIDescription | Brickwork | |
| CBIVersion | 2015 | = |
| Uniclass2015Code | Pr_20_93_52_02 | |
| Uniclass2015Version | Masterspec | = |
| Uniclass2015Title | Aggregate Concrete Bricks | |
| Author | Warren and Mahoney | |
| AuthorURL | www.warrenandmahoney.com | |
| ProductInformation | http://www.firth.co.nz/residential/designer-bricks/ | |
| ProductTechnicalStatement | | |
| SpecificationDescription | Firth Veneer Cladding | |
| SpecificationReference | 4263F | |
| SpecificationSystem | Masterspec | = |

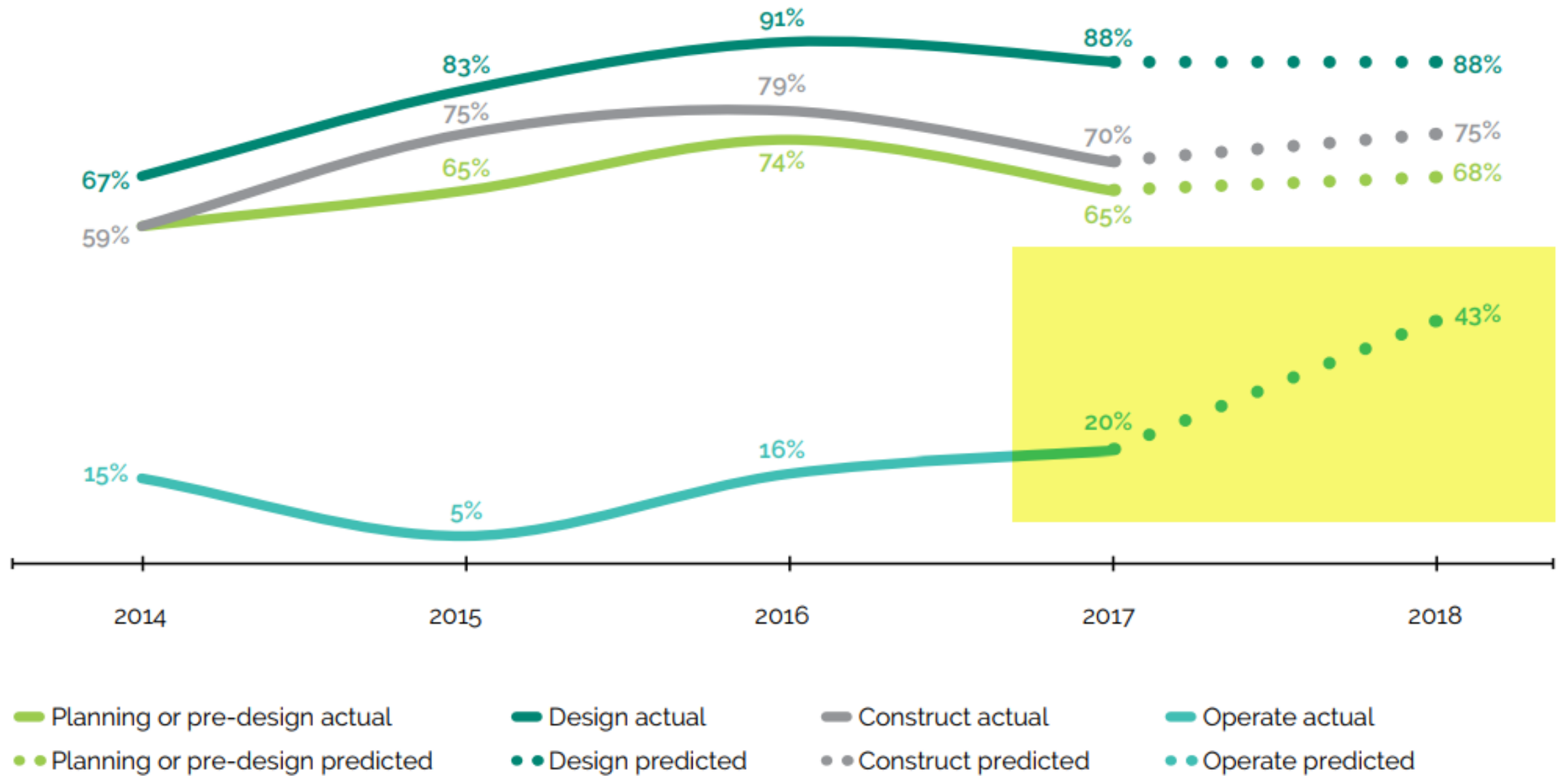| << Preview | OK | Cancel | Apply |
|---|---|---|---|

# New Zealand Asset Management standard (NZAMS)

- Intention it is used for central and local government assets providing for common metadata collection

- Facilitates evidenced based decision making

- Better decisions means significant saving on maintenance and investment

- Treasury funded the development of a business case and a draft standard.  Released as V1.0

# Industry BIM use across project lifecycle



Planning or pre-design actual — 2014: 59%, 2015: 65%, 2016: 74%, 2017: 65%, predicted 2018: 68%

Design actual — 2014: 67%, 2015: 83%, 2016: 91%, 2017: 88%, predicted 2018: 88%

Construct actual — 2014: 59%, 2015: 75%, 2016: 79%, 2017: 70%, predicted 2018: 75%

Operate actual — 2014: 15%, 2015: 5%, 2016: 16%, 2017: 20%, predicted 2018: 43%

**Legend:**
- Planning or pre-design actual
- Design actual
- Construct actual
- Operate actual
- Planning or pre-design predicted
- Design predicted
- Construct predicted
- Operate predicted

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# NZAMS covers

- Residential and Light Commercial Buildings

- 3 Waters (potable, waste, storm)

- Focus is asset and facilities management data (Vol 1)

- and structure for capturing operational data (Vol 2)

- Technical governance by:

  - NZTA – Lead (plus Austroads lead)

  - WatersNZ – 3 waters

  - Masterspec – Buildings

# Defines Asset Classes

| | | |
|---|---|---|
| Site | Fixtures and Fittings | Mechanical Equipment |
| Building Footprint | Electrical | Node |
| Ceiling | Fire Protection | Pipe |
| Floor | Data Communication | Pump |
| Foundation | HVAC | Pump Station |
| Roof | Plumbing | Retaining Structure |
| Stair | Cabling | Support Structure |
| Wall | Cathodic Protection | Tunnel |
| Window | Chamber | Valve |
| Space | Conduit | Potable Water Channel |
| Door | Containment Structure | Embankment |
| Appliances and Equipment | Electrical Equipment | Well |
| Lifts | Fitting | Stormwater Channel |
| Security | Instrument | Embankment |
| Signage | Linkages | Wing Wall |

# Concerns with NZAMS V1.0

- No alignment with international standards
- Is a proprietary standard licensed for use in NZ only
- Not structured in a BIM friendly format
- Has gaps (inevitable)

### Masterspec funded to develop V1.1

- Internationalise through alignment with IFC standards
- Structured to facilitate use in BIM
- Development of tools to assist use in BIM

# Masterspec BIM work

**Now**

- Keynote tool

Allows users to manually link specification to BIM objects

# Masterspec BIM work

## Now
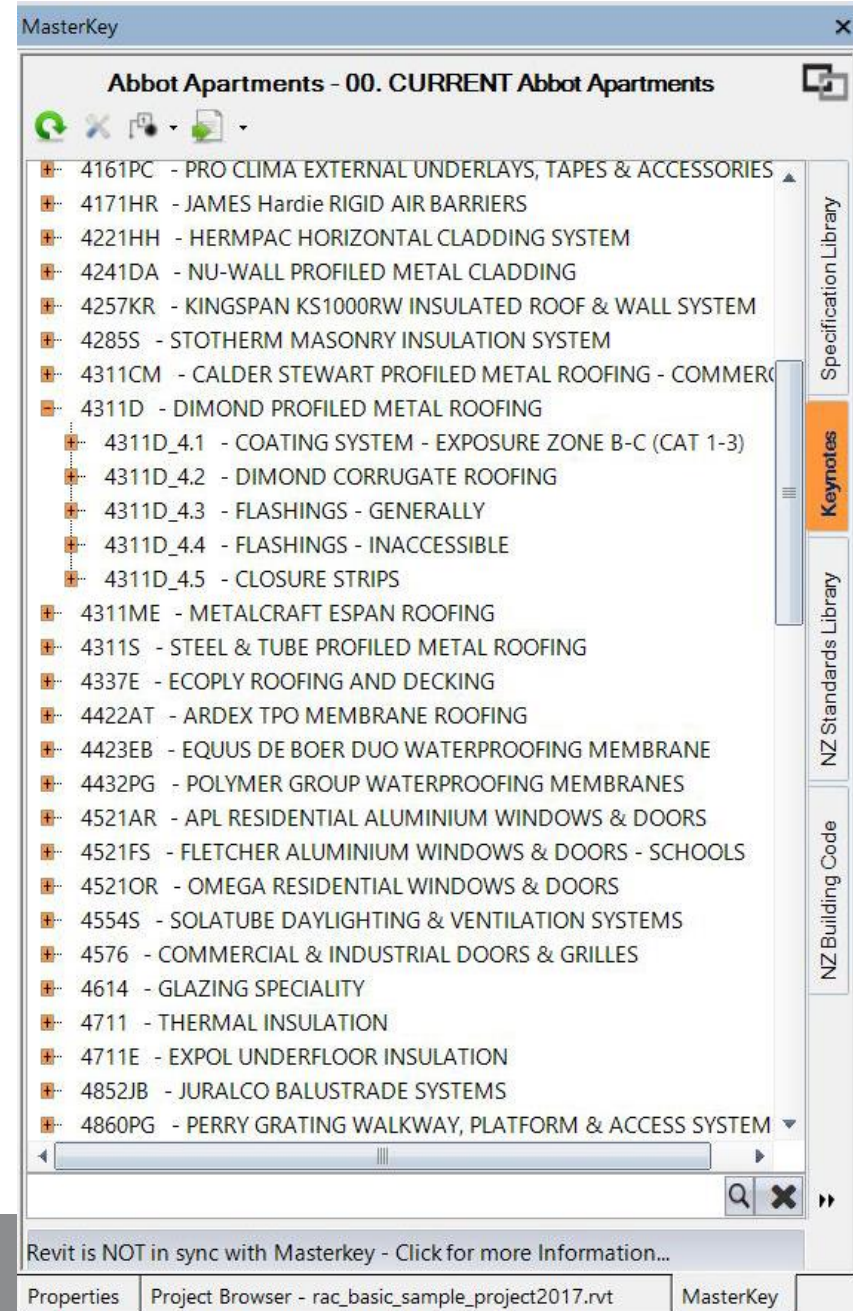
- Keynote tool

Allows users to manually link specification to BIM objects

## Coming

- BIM metadata standards

- BIM Library

- BIM to Specification Link

4311S_4.2
STEEL & TUBE - SIX RIB, LOW RIB TRAPEZOIDAL ROOFING

4711_4.1
THERMAL INSULATING PADS  R 2.6

5311G
GIB PLASTERBOARD TILE SUSPENDED CEILINGS

4221HH_4.2
HERMPAC WEATHERBOARDS - VERTICAL 32mm

4161PC_4.1
WALL PROTECTION MEMBRANE

masterkey ARCHICAD GRAPHISOFT.

masterkey AUTODESK REVIT

masterspec
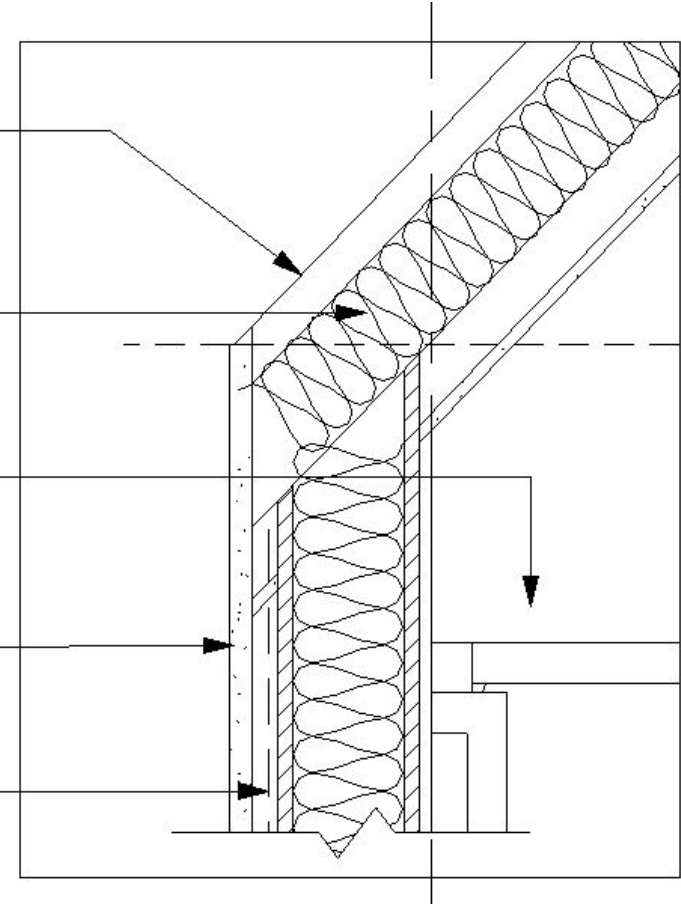
# It is a start to have common field names

- But to analyse things digitally you need consistent values as well
    - 100x50 PG H1
    - 90x45 H1.2
    - Pine H1 90x45
    - Rad H1 90x45mm


- These all mean the same thing, a person reading it knows this, a computer won't

# So we are working  developing BIM metadata

- Standard definitions for specification components/materials

| | |
|---|---|
| CBINumber: | 3321 Hollow concrete blockwork |
| Application | Block |
| Material | Concrete |
| Modifier | Firth® |
| Differentiator | 20Series |
| Grade | Hollow |

**Description**

3321_Block_Concrete_Firth®_20Series_Hollow
3321_Block_Concrete_Firth®_20Series_PartiallyFilled
3321_Block_Concrete_Firth®_20Series_SolidFilled
3321_Block_Concrete_Firth®_25Series_Hollow
3321_Block_Concrete_Firth®_25Series_PartiallyFilled
3321_Block_Concrete_Firth®_25Series_Solidfilled
3321_Block_Concrete_Firth®_30Series_Hollow
3321_Block_Concrete_Firth®_30Series_PartiallyFilled
3321_Block_Concrete_Firth®_30Series_SolidFilled
3321_Block_Concrete_Firth®_Architectural10Series_Hollow
3321_Block_Concrete_Firth®_Architectural10Series_PartiallyFilled
3321_Block_Concrete_Firth®_Architectural10Series_SolidFilled
3321_Block_Concrete_Firth®_Architectural20Series_Hollow
3321_Block_Concrete_Firth®_Architectural20Series_PartiallyFilled
3321_Block_Concrete_Firth®_Architectural20Series_SolidFilled
3321_Block_Concrete_Firth®_HotBloc®20Series_Hollow
3321_Block_Concrete_Firth®_HotBloc®20Series_PartiallyFilled
3321_Block_Concrete_Firth®_HotBloc®20Series_SolidFilled

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# Which can be added to a specification

**3321F    Firth® Concrete Masonry**

MANAGE & PRINT    VIEW    OUTLINE    **EDIT**    💾 SAVE  Saved at 1:29:18 PM    More Tools

1. GENERAL    2. PRODUCTS    3. EXECUTION    **4. SELECTIONS**

## 4.0.2 Walls

### 4.0.20 FIRTH MASONRY WALL 150mm

Specification for a concrete block wall.

| Layer | Thickness | Reinforcing Typ | Pointing Style | 0 | 0 |
|---|---|---|---|---|---|
| Block_Concrete_Firth®_15Series_Hollow | 140mm | No Reinforcing | Veed | 0 | 0 |

**Guidance Notes:**

nxndnm

Template Clause:    FIRTH MASONRY WALL

### 4.0.20 FIRTH MASONRY WALL 200mm Partial Filled

Specification for a bigger concrete block wall.

| Layer | Thickness | Reinforcing Typ | Pointing Style | 0 | 0 |
|---|---|---|---|---|---|
| Block_Concrete_Firth®_20Series_PartiallyFilled | 190mm | Reinforcing Spe | Grooved | 0 | 0 |

**Guidance Notes:**

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# Which can be added to a specification

**Details**

Clause Text

Specification for a concrete block wall.

SystemName

Guidance Notes

Components          Structured lists

| Sort | Layer | | Reinforcing Type | Pointing Style | |
|---|---|---|---|---|---|
| 0 | Block_Concrete_Firth®_15Series_Hollow | ∨ | No Reinforcing ∨ | Veed | ∨ |
| | Block_Concrete_Firth®_15Series_Hollow | ∧ | | Extruded | |
| Ke | Block_Concrete_Firth®_15Series_PartiallyFilled | | | Flush | |
| 3 | Block_Concrete_Firth®_15Series_SolidFilled | | ed Reinforcing Spec | Grooved | |
| | Block_Concrete_Firth®_20Series_Hollow | | | Raked | |
| | Block_Concrete_Firth®_20Series_PartiallyFilled | | | Veed | |
| | Block_Concrete_Firth®_20Series_SolidFilled | | | Weathered | |
| | Block_Concrete_Firth®_25Series_Hollow | | Reinforcing Spec | Grooved | 0 |
| | Block_Concrete_Firth®_25Series_PartiallyFilled | ∨ | | | |

Guidance Notes:

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# Linked to product SKUs



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# Template elements link BIM to specification

- Specification is work section based
- BIM is elemental

I.e. a wall has to refer to multiple specification sections

Layers

## \<Wall Material Takeoff>

| A | B | C |
|---|---|---|
| Material: Description | Material: Name | Area |
| Concrete masonry units | 3321 Block Concrete Firth® 15Series SolidFilled | 21 m² |
| Common brick | 4261 Brick Firth® Avonstone® | 21 m² |
| Plywood, sheathing grade | 3821 Frame RadiataPine H1.2 MSG8 | 22 m² |
| Gypsum Wall Board | 5113 Lining Plasterboard GIB® Standard 10mm | 22 m² |
| Generic Plastic | 6721 Dulux Acrylic 1Step Primer Sealer & Undercoat | 22 m² |
| Generic Plastic | 6721 Dulux Wash & Wear 101 | 22 m² |

FIRTH RAPIDSTAK™ 100 SOLID 10mm PLASTERBOARD ON BATTEN BOTH SIDES

# NZ BIM Library

- To support NZ designers and product suppliers

- To be built onto existing Miproducts system

- Not an object developer, host objects from manufacturers

- Consistent quality and metadata standard

- Metadata links to specification

- Range of generic objects to provide placeholders before selection

- Manage notifications of object changes

# We're here to help

- Assist you to understand how your products fit into BIM

- Help develop your BIM strategy

- Review your BIM content and provide feedback

- Create metadata to the standard

- Point you to options for object development

# Feedback and suggestions welcome

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**Thank you for your time and attention**