

# BIM in New Zealand — a subcontractor view 2019

Baseline information on the use  
of BIM across the New Zealand  
construction industry



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# BIM subcontractor survey foreword

As part of the BIM Acceleration Committee's strategy to continually identify potential barriers to BIM adoption, a new survey of the subcontracting industry in New Zealand has just been completed. This may become a regular and evolving feature if it proves valuable in the continuing quest to increase the use of BIM in New Zealand.

This latest EBOSS BIM survey represents the first commissioned by the BIM Acceleration Committee (BAC) specifically targeted towards subcontractors, and provides an interesting insight into a cohort that is traditionally required to work with the BIM output from the cohorts of previous BIM surveys (these being the designers and main contractors). In this respect, subcontractors form a link between the BIM workflow from the development of the initial BIM brief, through the implementation of the BIM Execution Plan (BEP's) to the final BIM output for clients' use. For this reason the survey has included a section on the transition of the BIM model between project phases.

The subcontractor group are also often required to provide the raw BIM data for inclusion in a federated model during clash detection, and to resolve the resultant clashes found through a process that may be stipulated in the construction BEP. As a result survey questions relating to the effectiveness of these processes were included.

The survey has been a joint venture between BAC and the University of Auckland (UoA) with the cohort group being taken from the approved UoA sub-contractor list. In this respect the survey represents the views of BIM users and practitioners working within the current New Zealand subcontractor environment. Our thanks go to all participants and to UoA Property Services for partnering with BAC.

Finally, should any reader of this report have any suggestions for improvement, please don't hesitate to e-mail BIMinNZ at [info@biminnz.co.nz](mailto:info@biminnz.co.nz) or raise the issue at one of the regular BIM network meetings now taking place in Auckland, Wellington and Christchurch (see [www.biminnz.co.nz](http://www.biminnz.co.nz) for more details).

Kind Regards



**ANDREW REDING**  
Chair, BIM Acceleration Committee



**GARY DAVENPORT**  
Member, BIM Acceleration Committee

Established in 2006, EBOSS hosts a comprehensive architectural product library, with an active audience of 35,000 architects, designers, main contractors and engineers. At EBOSS we are interested in improving the communication of BIM information through the construction value chain and appreciate the opportunity to partner with the BIM Acceleration Committee and sponsor this research initiative.



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# Executive summary

BIM is used in 43% of projects within the subcontractor group surveyed – but that proportion varies widely depending on the type of subcontractor. Three in ten actively push for BIM use on their projects (a few say they will create their own BIM data even if the consultant is not using BIM). However, one quarter say that even when BIM is available they will not use it.

Fewer than half of the subcontractor group surveyed are getting BIM Execution Plans (BEP) at least sometimes from consultants. When BEPs are provided they are mostly useful for identifying scope for estimating purposes – but subcontractors feel the BEPs now don't meet what they need in this respect.

In the transition from design BIM model to the construction model, over half say they generally discard the Design BIM and re-do it more accurately themselves. Only 5% agree that the level of detail in the Design BIM is sufficient for the transition to the Construction BIM.

At least half of the subcontractor group surveyed agree that BIM has added value when assessing existing site conditions, or that BIM has increased their use of prefabrication in construction. One quarter agree that the cost of accurately modelling is justified with savings during construction, or that they are using BIM to increase the efficiency of their work. Furthermore, one in five agree that the model is increasingly being used for populating As Built documentation.

When asked what the barriers are to BIM use, subcontractor group respondents say that the industry is not working together on BIM, they don't see the value of it, or they don't think it suits their trade (yet). When prompted with a number of barriers to BIM use, lack of skilled staff and consultants not sharing models are selected as the two largest barriers.

## Who are the subcontractor group?

In 2019 an additional survey was included as part of the BIM industry and client research. This survey was sent to subcontractors identified by the BIM Acceleration Committee (BAC) and University of Auckland, forming a new subcontractor group. A total of 26 subcontractor companies responded of 32 asked: giving a response rate of 81%.

The subcontractor survey was sponsored and managed by EBOSS on behalf of the BIM Acceleration Committee. It was analysed by an external researcher.<sup>1</sup>

### A little about the subcontractor group:

Discipline	
Electrical contractor	8
Mechanical contractor	6
Modelling/Drafting specialist	3
BIM consultancy	2
Hydraulic/Plumbing contractors	2
BMS contractor	2
Fire protection contractor	1
Other	2

Number of employees	
Conglomerate (100+ employees)	5
Very large (31 to 100 employees)	17
Large (10-30 employees)	3
Medium (5-9 employees)	1
Small (2-4 employees)	0
Unspecified	0

Location	
Auckland	20
Not specified	6
<b>Total</b>	<b>26</b>

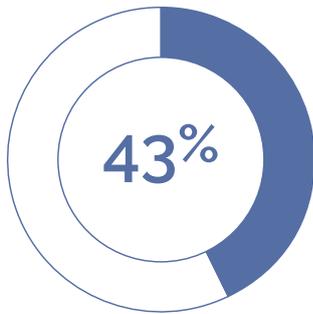
<sup>1</sup>The researcher is a member of the NZ Research Association, ESOMAR, and Australian Market Research Society, bound by strict codes of research ethics and requirements

# Is BIM currently being used?

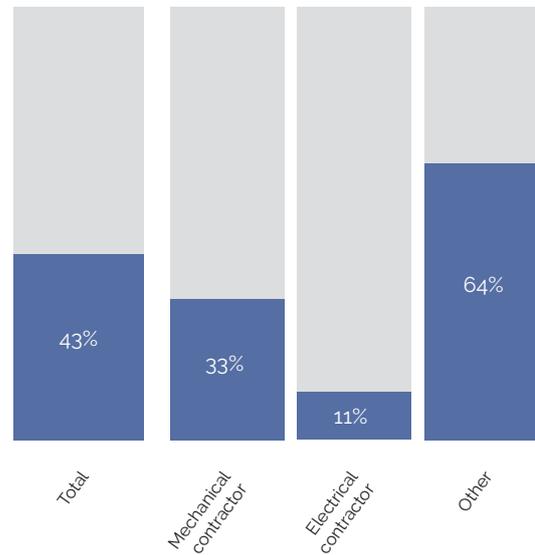
## Use of BIM

While the average is 43% of projects using BIM, this varies a lot based on the type of subcontractor. Those in the 'other' category in the chart below include BIM consultants, BMS (Building Management System) contractors, modelling and drafting specialists, hydraulic/plumbing contractors, and fire protection contractors.

## BIM use



of subcontractor projects use BIM



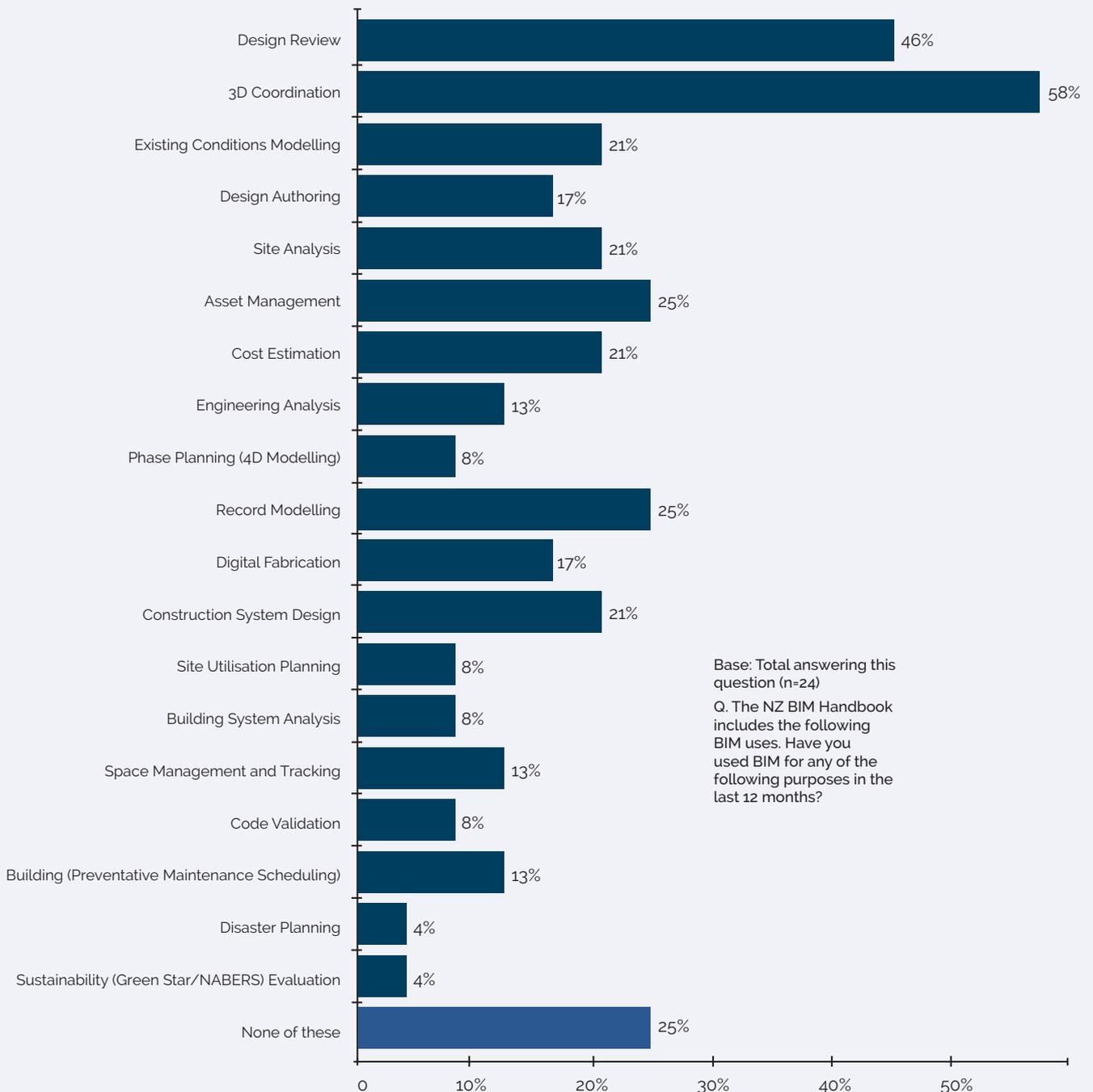
Base: Total answering this question. Total n=22, mechanical contractor n=6, electrical contractor n=8, 'other' n=8  
Q. What % of your projects use BIM?

## BIM uses in detail

Looking at the details of BIM use, 3D coordination and design review are the main uses for BIM among subcontractors.

Construction uses (as defined in the BIM handbook) include cost estimation, phase planning, existing conditions modelling, design authoring, 3D coordination, site utilisation planning, construction system design, digital fabrication, 3D control and planning, and record modelling. Of these 10 construction uses, only one is currently used by more than a quarter or subcontractors surveyed.

### Subcontractor's BIM uses (2019)



## BIM handbook use

One third of subcontractors say they haven't heard of the BIM handbook, while 21% say that they have heard of and used it. The remaining 46% say they've heard of the handbook but haven't used it. This raises the question of why not? We haven't asked a question around that this year, but data on barriers to BIM use suggests that they may not see the value of BIM or they're not getting exposed to it from consultants.

### BIM handbook use

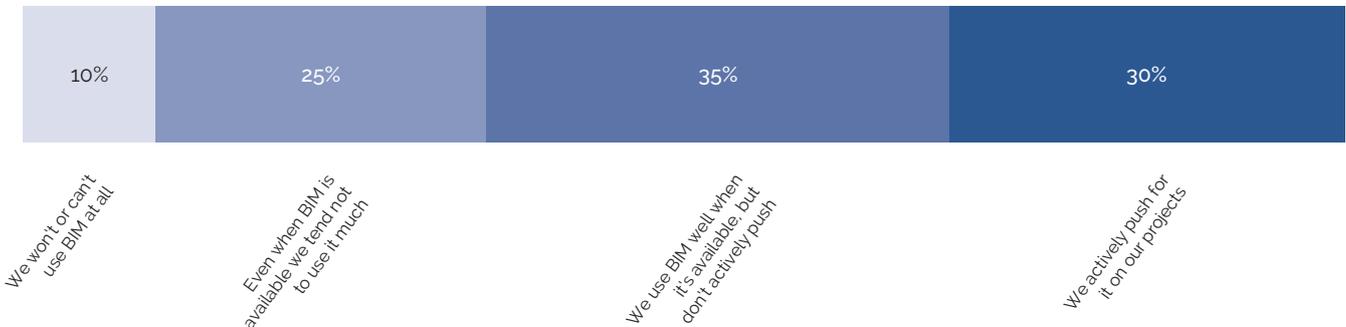


Base: Total answering this question (n=24)  
Q. Before today, had you heard of and used the NZ BIM Handbook?

## Subcontractor attitude to BIM

The subcontractor group were asked to rate their attitude towards BIM on a scale of "actively push for it" through to "won't or can't use BIM at all." 30% say they actively push for BIM, while 35% either won't use it (even if it's available) or can't use it.

### Attitude towards BIM



Base: Total answering this question (n=20)  
Q. Where would your company sit on the scale below when it comes to using BIM?

## Sharing of BIM Execution Plans (BEPs)

Fewer than half (46%) of subcontractors surveyed are getting BEPs at least sometimes on the projects where consultants have used BIM. 14% say they always receive a BEP where the consultant has used BIM.

The industry and client groups both raise the lack of collaboration with trades. This data confirms that BIM information is not being shared across all parties involved in a project.

### Sharing of BIM execution plans

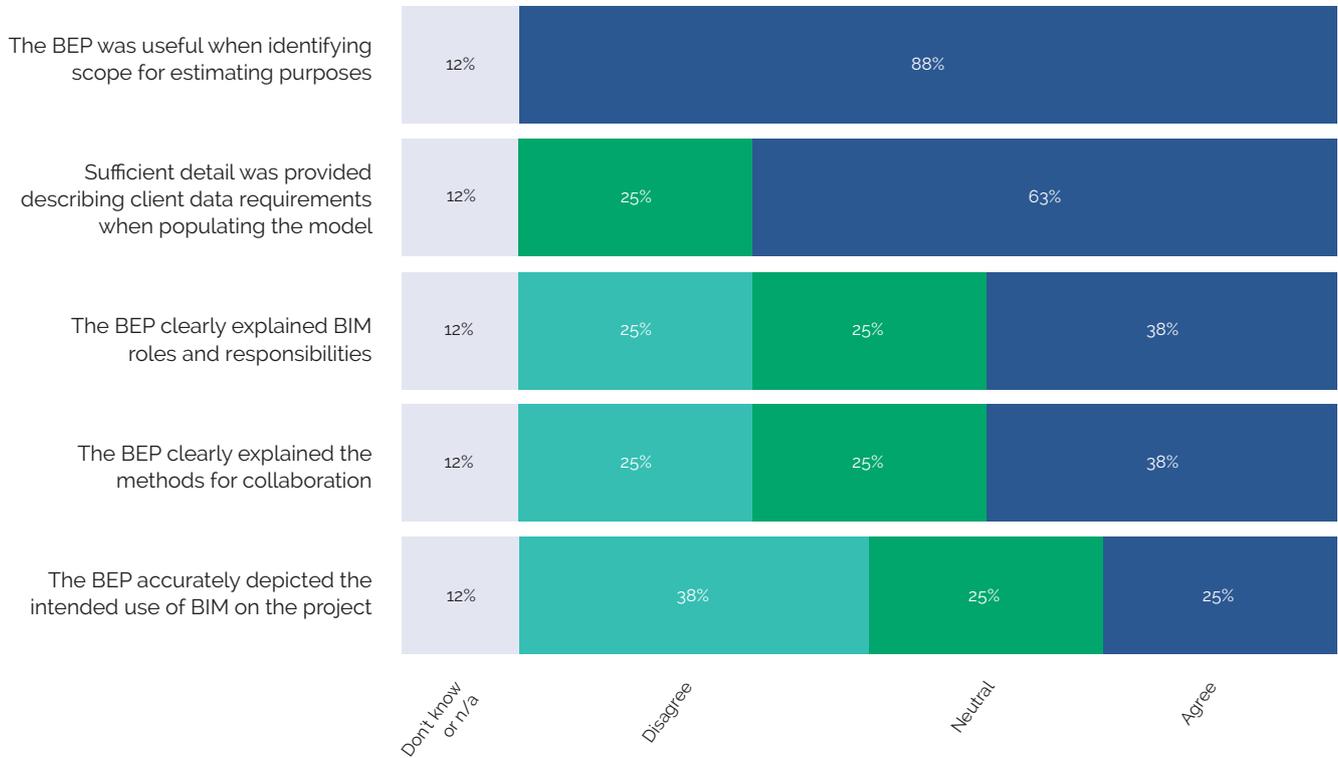


Base: Total answering this question (n=22)

Q. On the projects where the architect or consultants have used BIM, how often are you issued a BIM Execution Plan (BEP) describing the intended purpose of BIM on projects?

For those who were receiving BEPs subcontractors were asked to rate the BEPs they were receiving on several factors. The majority agree that the BEP was useful for identifying scope and estimating purposes, and that sufficient detail was provided on roles, responsibilities and methods of collaboration. However, 25% agree that the BEPs received accurately depicted the intended use of BIM on the project.

## The quality of BEPS provided to subcontractors



Base: Have received a BEP from a consultant (n=8)

Q. Across all of the BEPs you receive, please rate how strongly you agree or disagree with the statements below in general.

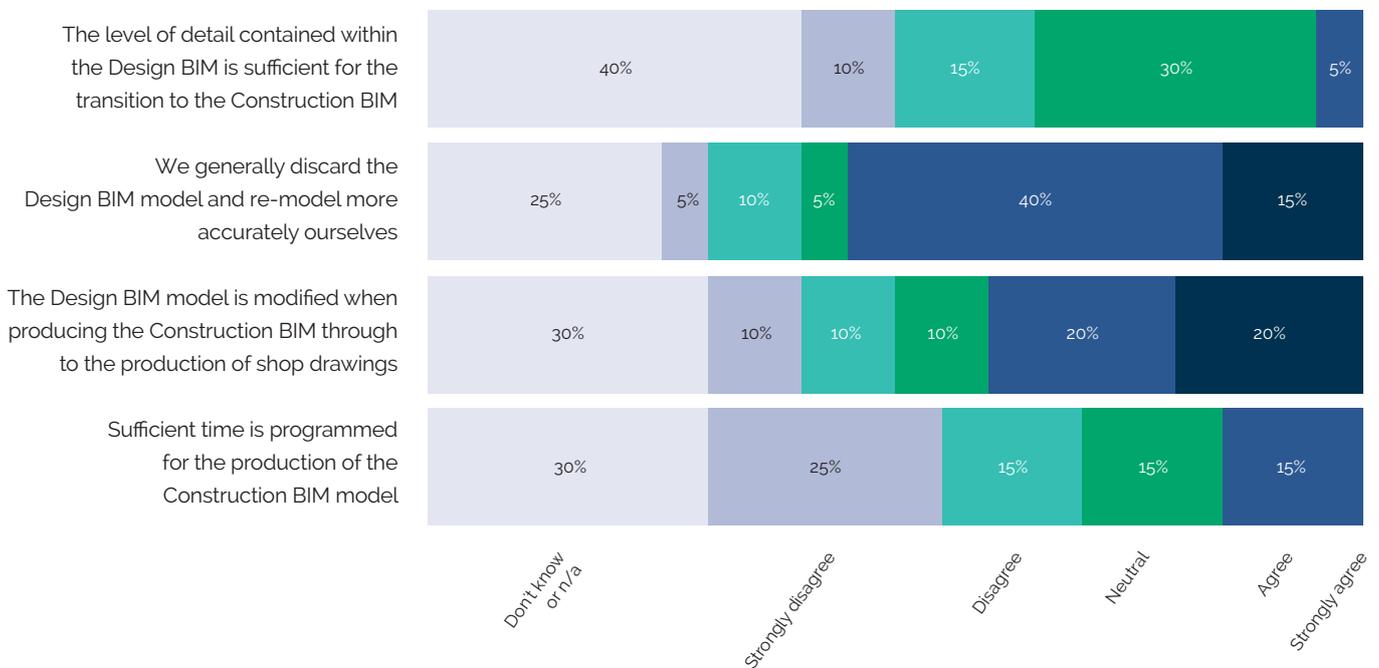


## The transition from the Design BIM to the Construction BIM

The subcontractor group were asked to rate several factors in relation to the transition from the Design BIM to the Construction BIM.

Over half of those surveyed say they generally discard the Design BIM and re-model more accurately themselves. Related to this, only 5% agree that the level of detail contained in the design BIM is sufficient for the transition to the Construction BIM.

### The transition from the design BIM model to the construction BIM model



Base: Total answering the question (n=20)

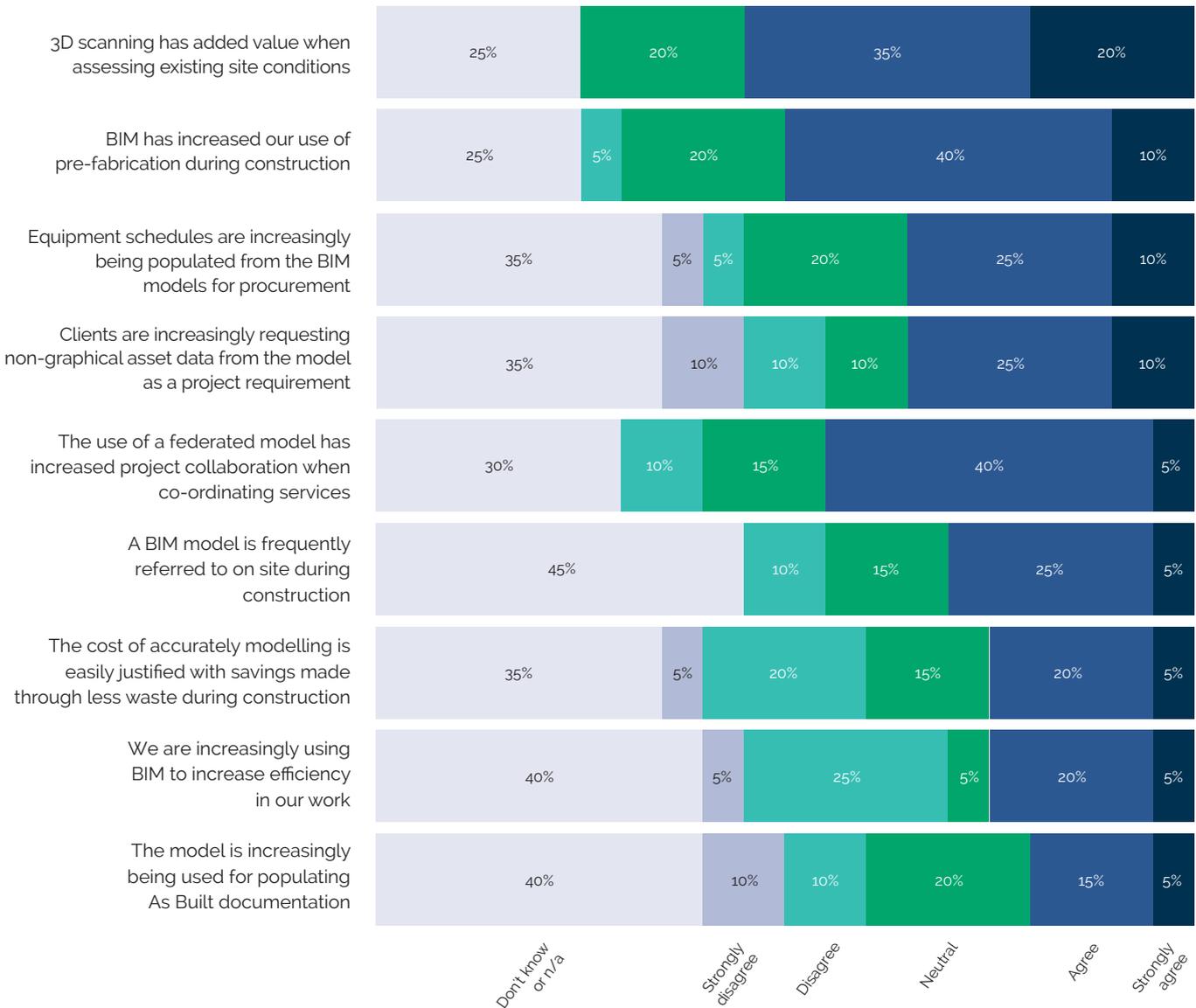
Q. The following statements relate to the transition from the Design BIM model through to the Construction BIM model. Please rate how strongly you agree or disagree with each statement.

# The value of implementing BIM and the production of documentation

Subcontractor group respondents were asked to rate several factors in relation to the value of implementing BIM and the production of documentation.

At least half of subcontractor group respondents agree that 3D scanning has added value when assessing existing site conditions, and that BIM has increased the use of prefabrication during construction. By contrast, one quarter or fewer agree that the cost of accurately modelling is justified due to savings made, that they're using BIM to increase the efficiency of their work, or that the model is being used for populating As Built documentation.

## The value of implementing BIM and production of documentation



Base: Total answering the question (n=20)

Q. The following statements relate to the value of implementing BIM on a project and the use of BIM in the production of project completion documentation. Please rate how strongly you agree or disagree with each statement.

# Barriers to BIM uptake

Subcontractor group respondents were asked what they see as the barriers to using BIM. Initially this was asked as an open-response question. This was then followed with barriers to BIM use based on previous years' industry and client surveys.

The open questions highlighted three main themes:

1. The industry not working together on BIM – this includes a lack of collaboration and not considering the use of other parties involved in a project;
2. BIM doesn't suit or work for their trade – either it would mean too much of a shift in the way they work or they don't see they would have much to contribute once the BIM reaches them;
3. BIM doesn't offer value – the costs outweigh the benefits at this stage.

Some comments from subcontractors illustrating these main themes are outlined below.

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The industry not working together:

"A lack of awareness of the advantages incorporating BIM into projects by either clients or project managers, and a lack of contractors/subcontractors with BIM capabilities. Other parties involved are reluctant to use BIM effectively mostly due to poorly scoped contracts. The requirements of clients tend to get vague or clients are unsure of their requirements at times which makes it difficult for us to frame the scope of our projects."

"All trades and architects need to use the BIM model or not at all. It's no use if someone isn't coordinated on it. Also standard details and seismic requirements need to be incorporated in the model."

"Uptake of BIM by main contractors is varied from well organised to not using. Receiving accurate design models is still a challenge. Good architectural models are becoming more available but sometimes lack the detail for accurate coordination."

BIM doesn't offer value:

"We do not have any internal issues completing all our work in a BIM environment, and are not convinced its any faster or more efficient in construction. It just enables the design of tighter more constrained buildings where you can start with no fat and add some in, rather than start with what we hope is enough in terms of services spaces, which isn't valid for all buildings."

"Minimal benefit other than clash detection and costs generally greater than benefit."

"The main barrier is time. It takes twice as long to model in 3D as 2D, and 2D is sufficient for most of our work. Skilled staff is also a limitation. To take a design from a consultant design and bring it up to a fully detailed, coordinated, buildable model requires more than a knowledge of how to use the software."

BIM doesn't suit or work for their trade:

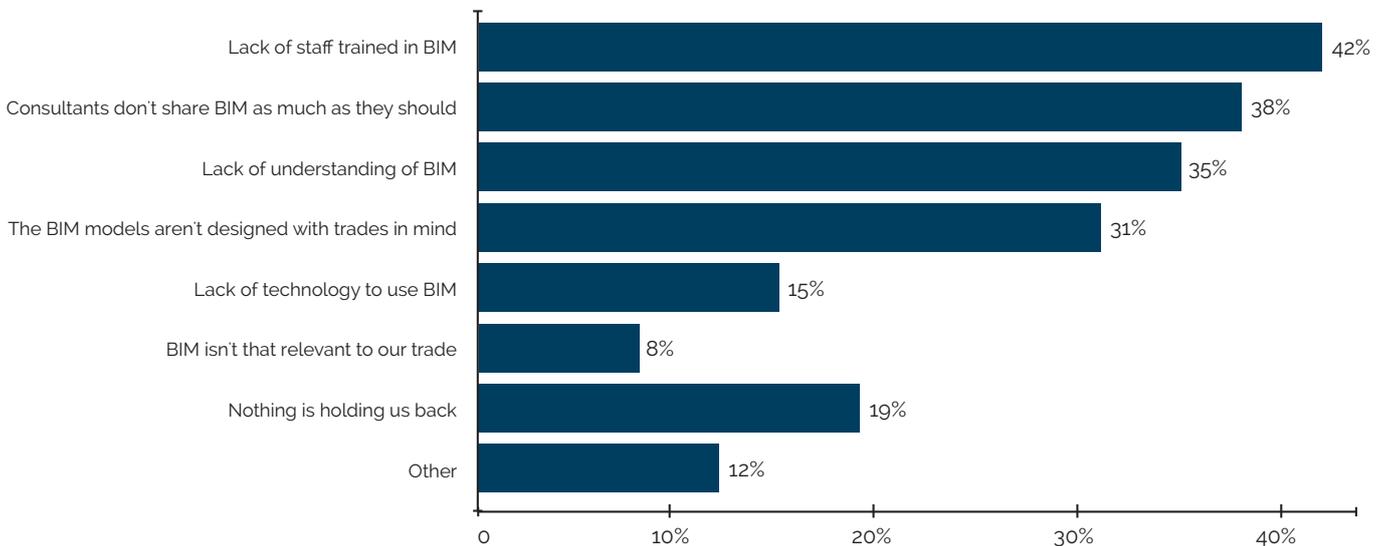
"BMS companies without an embedded installation team don't have a compelling requirement for a 3D model of the project. Sensor positions are something that are generally done by others. We can see a need to use it but it would require the BMS/E4M electrical installers to as built the cabling installation in 3D. They don't use as built cable runs in 2D now so this would require a major overhaul of how our trade operates."

"Difficult to model certain elements on sloping ceilings/structure to get the annotation symbol to display, especially sprinklers. It is time consuming to generate a fire protection model natively in Revit as they are typically designed in AutoCAD, then coordinated to suit."

"As a hydraulic company the design is usually done before we tender so it has to go through the consent process. It's then very hard to change. In saying that a lot of the hydraulic companies are using BIM so we in turn are using it in on the sites that already have a model."

From among the barriers to BIM use identified from previous industry and client surveys lack of trained staff, lack of collaboration, lack of understanding, and BIM not designed with trades in mind are all key barriers to using BIM for subcontractors.

### Barriers to using BIM



Base: Total sample (n=26)

Q. We have a few hypotheses on what might be holding BIM use back amongst trades. We've listed a few below. Select all that would apply to your business.

# Subcontractor Group Organisations

Subcontractors group organisations include:	
Allendale Electrical Ltd	Economech
Aquaheat NZ Ltd	Express sheetmetals NZ Ltd
asBUILT	Fonko
Axis Plumbing	Heatwave Mechanical
Bassett Plumbing & Drainage Ltd	M&E Caddesign Limited
Building Technologies Ltd	Numecon Contracting
Callander Electrics Ltd	Singer Group
Chenery Technologies Ltd	

Some organisations wished to remain anonymous and we have not published their names in this report.

The subcontractor group are made up of organisations that have been identified as key users of BIM, or likely to use BIM to manage a portfolio of property or other constructed assets.