



Specification Report 2017



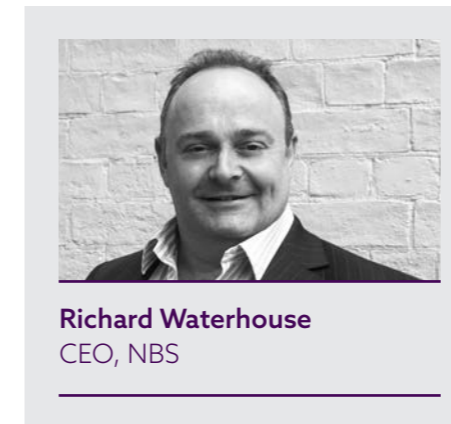
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Specification is at the heart of construction information



With the rise of BIM, much has been made – rightly – of the technological transformation of the design process. But the fundamentals remain the same. The designer continues to create a design vision in response to the needs of the client. This creative vision is expressed in, and maintained by, detailed construction information.

In the best cases, this design vision is fully realised. Increasingly, this is achieved through collaborative working throughout the project timeline. This collaboration involves close working with many parties, including the client, contractors and construction product manufacturers. Effective collaboration requires shared understanding. In turn, shared understanding relies on a clear, unambiguous description of the shared goal: that which is to be built.

Specifications are integral here. They alone provide the level of information required to fully express design intent.

Not only that, the specification provides a reference point for construction and maintenance decisions made throughout the project. It also serves as a legal document to protect the designer from the all-too-frequent disputes that arise within the construction process.

A timely produced and well-written specification can save significant work, expense and worry later on in a project. It can also protect professional reputations.

The results of our survey show that specifications remain integral. They can, of course, take various forms (such as performance-based, or more traditional specifications), and often evolve throughout a project's life.

The specification process is not without difficulties though. Too often, it is rushed and only started in the developed and technical design stages. Six out of ten respondents tell us that they feel they 'rush' specification writing. Errors can be made through reuse of specifications without detailed checking. Design intent can be eroded through product substitution and value engineering. Project information can be held in various places and in various formats, most notably in a BIM and in a specification. This information needs to be consistent; conflicting drawings and specifications causes real problems on the ground.

At NBS, we have been helping specification writers for over 40 years. We produce a range of tools to bring rich, up-to-date and standardised information to the specification writer. Guidance helps make sure the specification is well-written and robust. Office masters embed practice knowledge and help standardise specifications. Standards are fully referenced and kept up to date. NBS Plus brings a wealth of detailed construction product information to the specification writer just when it's needed.

However, at NBS we are also aware of, and leading on, the radical changes that we are seeing within construction information. NBS Create is the world's first BIM-ready specification writing environment.

The NBS BIM toolkit is a free-to-use tool that allows the designer to set out who is responsible for what and when within a project, and to describe the level of detail and level of information that's needed at each stage of the RIBA Plan of Work. Through our 'plug-ins' to all leading BIM creation tools, you can rapidly check for inconsistencies between a model and a specification. The NBS National BIM Library allows you to drop generic and propriety BIM objects into the BIM, knowing that those models conform to the NBS BIM Object Standard.

What's significant here is not just the available range of tools, but their interoperability. Through the NBS design information ecosystem, we have enabled the designer to ensure consistency and accuracy across a range of information sources. This is needed to provide the framework for effective collaboration.

Great buildings start with great design. Realising that design requires effective information management. Specifications are at the heart of that, and well-written specifications that integrate with the information ecosystem will bring efficiencies to the design, build and maintain process. This in turn means better delivery on client requirements, more likely realisation of design intent, reduced risk for the designer, and, potentially, cost savings and greater profitability for the design community.

We hope this report helps understanding of current specification practice, and shows the direction of specification in our increasingly information-rich industry.

Why specifications are still important



Tina Pringle
Head of Technical Information, NBS

Tina joined NBS in 2014 and is Head of Technical Information, responsible for the delivery of technical information. Her teams include the technical authors, technical writers and the editorial team who deliver the content in NBS specification products.

Tina qualified in International Business and Information Technology, and has extensive experience in the construction industry. She started her career in construction product manufacturing, and progressed through Built Environment consultancy, estate development and asset management, master planning and capital project planning and delivery, with a specialism in Education and Healthcare construction.

She is committed to enhancing the knowledge used within the construction industry, content management and specification, and ensuring the use of information throughout the lifecycle of the asset.

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As the world of construction develops, adapts to the BIM environment and embraces the challenges of becoming a digital industry, the specification is still a critical part of the construction process. In fact, it is as essential now as it has ever been, and forms an integral part of the BIM environment, project collaboration and its associated digital documentation, developed from the briefing stage and used on through to the management of the asset.

You may ask yourselves if specifications are as important now that we have 3D, 4D and even 6D models. The answer is that while they provide brilliant digital imagery of the environment and some associated information, the specification documentation links this together.

Let's look at what we mean when we talk about a specification; here is an official definition:

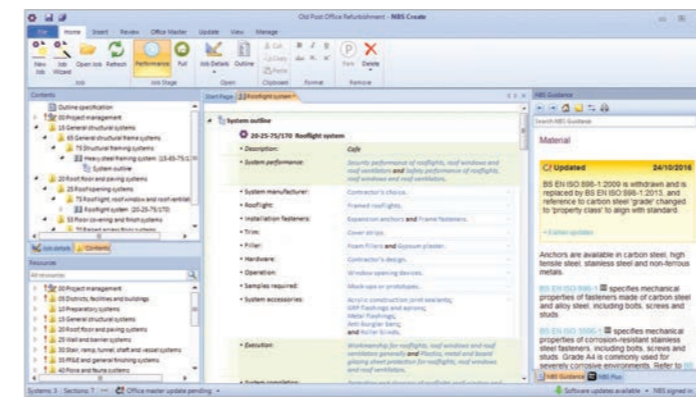
Specification: A detailed description of the dimensions, construction, workmanship, materials, etc., of work done or to be done, prepared by an architect, engineer, etc.

Source: Shorter Oxford English Dictionary.

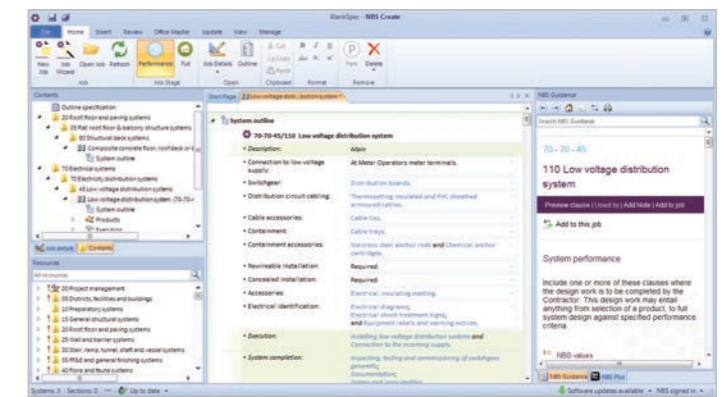
A specification is the document that describes, in words, what cannot be visualised or explained on a drawing or in a model. This is not only applicable to construction; the same principles can be applied to all industries, from the aerospace, oil and gas and automobile industries to manufacturing.

In construction, the specification can cover everything from the establishment of the site, the type of contract to be used, the performance criteria of the asset, the quality of the systems and products, which standards are applicable and how they should be executed, to even the products which are to be used. The type of specification can relate to the project or the procurement route, whether it is performance-based, prescriptive or propriety, all of which are dependent on the project requirements. Specifications are required during the design stage, are part of the contract documentation, and play a key role in project fulfilment.

A specification is the document that describes, in words, what cannot be visualised or explained on a drawing or in a model.



Early specification - lessons learned



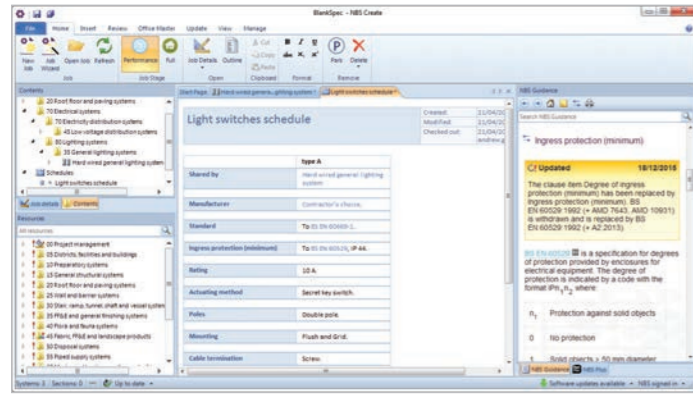
Early specification - decision

Let's look at the main reasons why the specification is so important to the construction process:

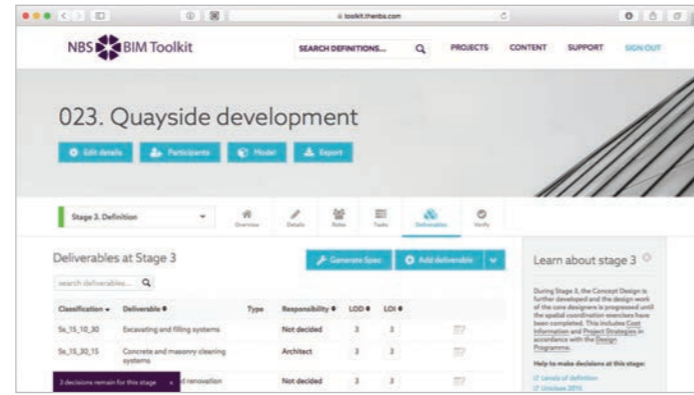
- It provides clear instructions on the intent, performance and construction of the project.
- It can reference the quality and standards which should be applied.
- Materials and manufacturers' products can be clearly defined.
- The requirements for installation, testing and handover can be identified.
- Classification in the specification can be used to support handover and running of the asset.
- The drawing or model does not need to be overloaded with detailed information, which can sometimes be difficult to identify.
- It can be used to support the costing of a project: not only the materials and products but also the performance and workmanship.

- The specification forms part of the contractual documents, along with the drawings, and therefore can help minimise project risk and provide support should there be any legal disputes.
- It supports the interpretation of the client brief and gives the client assurance that the asset which they commissioned is being delivered.
- It is not only essential for the construction phase but also used as part of the soft landing process, subsequent asset management and the lifecycle plan.
- By being clear and concise and containing all the information, it saves the project team, the client and the contractor time and money by providing answers to many of the on-site construction questions.
- There is the option for the design team to build a suite of office masters, which would improve efficiency, provide quality assurance and project consistency.

- Office masters can save the team time and money by being developed over a period of time and then being adapted to suit the project specifics, therefore drawing on specialist knowledge when needed.
- The specification should be used by all the project team throughout the construction phase; it should be a living document and not stop being used at the design phase.
- The specification and any variations or value engineering can also be used for the project audit trail and should form part of the handover documents. It will then form the basis for the running of the asset by the asset management team.



Performance spec – outline spec



Full spec – timeline decision and level of detail and information

When should we write a specification?

Specifications often used to be one of the last items written before a package was issued for tender, but this has changed over time, and especially with the advent of building information modelling (BIM).

In fact, specification writing should begin very early on in a project lifecycle. Early stage specifications can be seen as part of the review with the client about what they are looking to achieve on the project. This early stage work also provides an understanding of the performance requirements of the project, so that when discussions develop on complexes, entities, space, locations, elements, systems and products, these form part of the build-up of a specification. The information incorporated in the client's EIR (Employer's Information Requirements) then all contributes to the build-up of the project specification.

In essence, specifications are about data communication, and the exchange of information between the client, the designer and the contractor.

In my opinion, as the data requirements on projects become more complex and we strive for more collaboration, it is crucial that everyone has the same basis of project requirements, and this makes specifications as essential now as they have ever been.

For over 40 years, the team here at NBS has been developing and delivering specification products and tools which allow their users to write and deliver construction specifications in a BIM environment. NBS Create in particular is ideal for project collaboration, allowing teams to develop and refine information for the life of the project.

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The alternative to last-minute specification writing



Dr Stephen Hamil
Director of Research
and Innovation, NBS

Stephen has worked at NBS since 1999 and has played a major role in the development of products such as NBS Building, NBS Create, the NBS National BIM Library and the NBS BIM Toolkit. He now leads the Research and Innovation team that focuses on understanding customer needs and developing innovative digital solutions to meet these needs.

🐦 @StephenHamilNBS

Challenges

A specification is a key contract document, typically produced during the technical design stage of a project. It is issued as part of the tender documentation and used throughout the subsequent timeline of the project. The content of a typical specification is traditionally a description of systems and products on a project and how these systems and products should be installed, finished and tested. This specification provides detailed technical information that accompanies what is visually represented in drawings or models. When preparing a well-written specification, there are a number of challenges. Three common problems are listed below:

1 Leaving the task of specification writing to be the final job of the technical design.

Too often stories are told of specifications that are written on the Friday afternoon (or even over the weekend) to complete the tender package. Designers are often given challenging deadlines for projects and as a consequence, writing the specification may be the task that gets pushed back.

2 Not recognising the need for a different approach to specification where contractors have design responsibility.

Design responsibility does not always fall to the designer directly employed by the client: many designers will work on projects where the description of the types of products is not their responsibility. On these projects, the client's designers must describe the required overall performance of these systems and leave the system and product choices to the design team employed by the Contractor.

3 A lack of communication and collaboration across the design team.

With modern technologies, many design teams are now collaborating by sharing models so that the spatial design of the architecture, structural and building service engineering is coordinated. However, it is not always the case that the same level of information-sharing takes place across the different disciplines with respect to specification responsibility and decision-making. This is especially true when considering the first two points – if specification writing is taking place late in the workflow and there is not sufficient clarity on responsibilities, then this can lead to confusion on the project.

Addressing these challenges

It is worth considering how the above challenges can be addressed. The need for early collaboration around specification decisions and proper planning can go a long way towards making this process a lot smoother. The RIBA Plan of Work provides a well-respected, standardised structure for documenting design responsibilities and deliverables. This structure also allows design intent to be documented early on so that architects, engineers and the wider team can start to transition from the briefing stage to the stage where technical design starts to develop.

For example, early on in a project there can be an understanding over whether curtain walling is required. The client's requirements may be captured and the designer responsible may note whether, contractually, their responsibility will be for a full or performance specification. This may be documented at an early stage prior to any technical decision over whether the curtain walling is a stick or a unitised system. The same principles may be applied to the engineering work. For example, responsibilities for the heating system may be determined, and early discussions can take place which will inform the space requirements for potential plant rooms and the heat emitter requirements that may influence the interior design.

The plan of work should be produced collaboratively, and it should be updated at each stage of the project as more decisions are made. Too often on projects information is communicated but not documented, or it is documented in emails which are then not recorded properly.

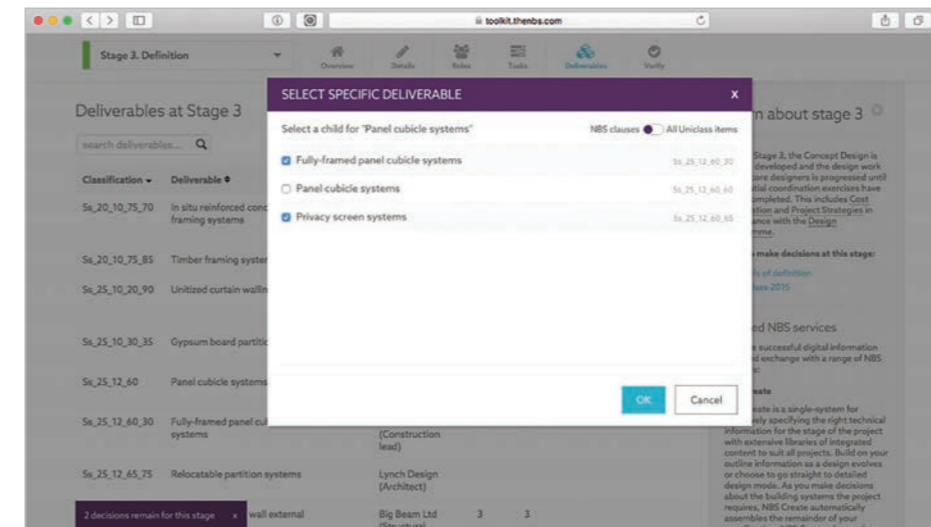
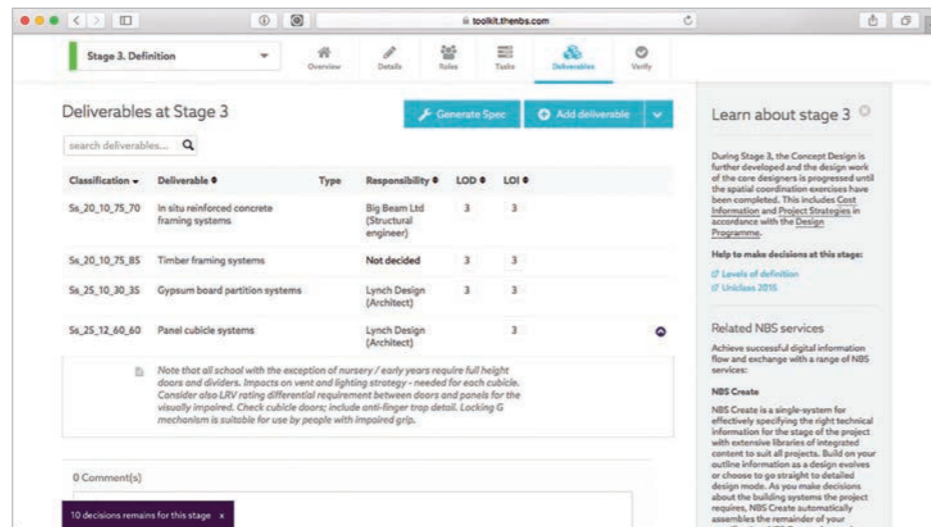
If this process is followed then specification writing becomes a much easier task, and also one where the risk of incorrect decision-making has been greatly reduced. The information will have grown from the initial brief, structure will have been applied and responsibilities will be clear.

An industry-standard process such as this can be of great value, particularly when a project team comes together for the first time. When a team works together on a number of projects, or when a client procures many similar buildings, then this process can be greatly simplified.

With modern technologies, many design teams are now collaborating by sharing models so that the spatial design of the architecture, structural and building service engineering is coordinated.



Producing a collaborative plan of work



It is possible to develop this information as the project develops. In this example, following the concept design stage, the architect has determined that fully-framed cubicles and privacy screen systems are required.

The plan of work should be produced collaboratively, and it should be updated at each stage of the project as more decisions are made.

Case study

A case study was featured on the NBS.com website last year featuring Manchester City Council (www.thenbs.com/manchestercitycouncil). This detailed how the council were developing a standardised plan of work that detailed responsibilities and lessons learnt from previous projects to be used on a number of upcoming school projects.

Alistair Burns, Design Manager with the Capital Programmes and Property Team for the Council, has over 20 years' experience working on schools projects and coordinated this initiative.

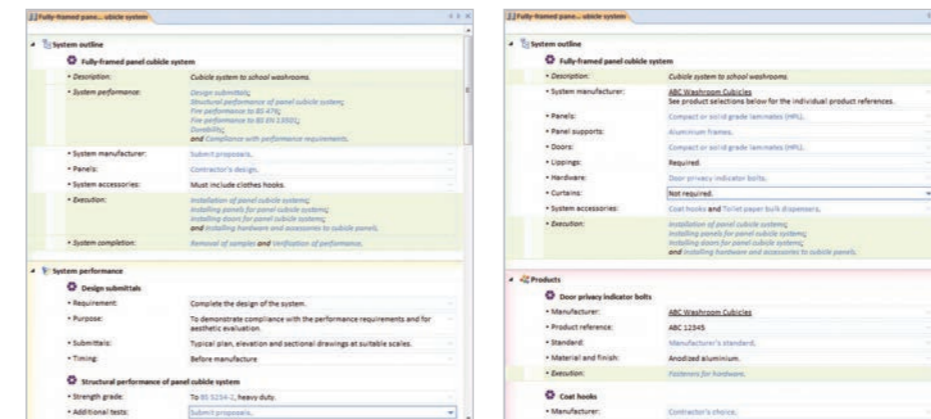
Alistair commented: "The Council's Capital Programmes and Property Team wanted to have a template in place that captured the knowledge of the department and the years of experience and lessons learnt from previous projects. This would put the organisation in a strong position to have clarity on client information requirements on projects. In developing well-structured digital information, the team at Manchester believe better project outcomes would be guaranteed and, in using the Digital Plan of Work across all

stages, data flow would be significantly improved." The example above shows the standardised plan of work for Manchester schools. It can be seen that the lessons learnt from previous projects are documented against the high-level technical deliverable. Responsibility is clearly defined against a role; the company undertaking this role is then to be determined on each individual upcoming project as that specific team is assembled.

Specification writing is a complex skill, but by giving it sufficient consideration early on in a project then the task of specification can be greatly simplified.

In summary:

- 1 Discuss specification responsibilities at an early stage and document these in a standardised plan of work structure;
- 2 Use a master specification system that allows both performance and prescriptive specification; and
- 3 Collaborate across the project team so that the specification's intention is clear and decision-making is facilitated.



Far Left Performance specification and Left Full specification Based on the project's requirements and the procurement method selected, these systems can be specified by performance or prescriptively by the products that they contain. In the first example, a performance specification is being developed that sets out the constraints for the design work to be completed by the Contractor. In the second example, each product that makes up the system is fully specified.

Support

A list of free-to-use and subscription solutions that support the principles covered in this article is below:

- A free-to-download set of tasks and a standardised responsibility matrix is available in Microsoft Excel format at the RIBA Plan of Work website: www.ribaplanofwork.com/toolbox.aspx
- This same content is available in a free-to-use online collaborative environment within the NBS BIM Toolkit: theNBS.com/toolkit
- For those writing performance and full building and landscape specifications, NBS Create is the premium specification solution: theNBS.com/create



Specification survey: summary of findings



Jenny Dobson
CMRS, Market Research
Co-ordinator, NBS

Jenny has 11 years' experience in market research, four of those at NBS. She specialises in quantitative research and has experience in other areas, including in-depth telephone interviews and competitor analysis. Projects at NBS have included the NBS Specification Survey, the NBS National BIM Survey and the RIBA Appointments Skills Survey. She has also carried out a number of research projects for the UK Government, construction product manufacturers, the RIBA and NBS.

Outside the built environment, she has delivered research for the public sector, including supervising Northumbria Police consultation team's telephone interviews. This research provided data which informed service delivery improvements and marketing campaign evaluation.



In November 2016, we ran our fourth NBS Specification Survey to understand how the industry is changing the way it writes specifications as it continues to adopt digital ways of working. The intervening years since our last Specification Survey, in 2013, have seen many changes for the construction industry. In particular, we have seen a rise in the use of digital technology, and have passed the Government's April 2016 BIM mandate, but how have these changes affected the specification process and what does the industry expect for the future of specifications?

This year we received more than 500 responses to the survey. We would like to thank those who took the time to complete the survey, without whom this report would not be possible. Those responding to the survey came from a range of disciplines, practice sizes and age groups. They have worked on a range of project types including new build, refurbishment and historic conservation projects; and did not just include those using NBS specification tools. This comprehensive representation of project types, sectors and other demographics has provided us with a good understanding of current views about specifications.

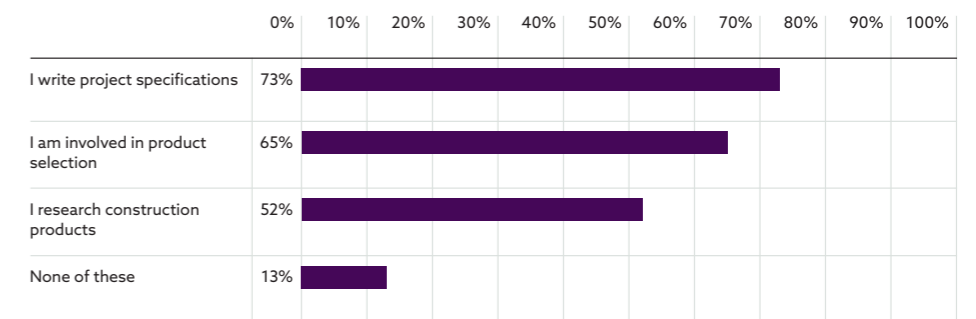
In this report, we examine how and why specifiers create specifications, as well as the types of information that they need to include within them, and how they get this information. We also look at barriers to their production, or other difficulties experienced when producing or using specifications. Finally, we look at attitudes towards specifications and the future of them. Throughout the time we have been running this survey, we have retained some core questions that we have asked in each survey. This allows us to track changes and trends, which we will refer to throughout this report. We hope you enjoy reading the findings.

Comprehensive representation of project types, sectors and other demographics has provided us with a good understanding of current views about specifications.

Creating specifications

For many respondents, producing specifications forms part of their role: nearly three-quarters of respondents (73%) tell us they write project specifications. The specification process has many elements to it. As well as the actual production of the specification, the process involves considering products, workmanship, and producing supporting documentation such as drawings. Many of those responding to the survey are involved in considering products, with 65% telling us that they are involved in product selection and over half of respondents (52%) involved in researching construction products.

Which, if any, of the following tasks do you carry out as part of your current role?



Why write a specification?

There are many reasons for writing a specification, including its contractual role, and the part it plays in setting out the design intent, performance and construction of the project. We have documented several of these on theNBS.com¹, but we wanted to understand respondents' main reasons for writing specifications.

Primarily, it is about setting out designers' and clients' expectations and criteria for the project; this may include details of specific products to be used, performance expectations and instructions about how the work should be carried out, and to what standard:

"To define quality of workmanship and provide further detail on materials and products the design includes which does not appear on the drawings".

"To get the projects procured and built the way the architect/client want it done and to perform [in] the ways it was designed. To help manufacturers communicate the properties of the product/system to help prevent substitution with different or inferior properties".

Other commonly cited reasons include: tendering or pricing purposes; to provide clarity for everyone; and to use as a measure to ensure that the final project meets the expected standards and aims of the project. Everyone involved in a project hopes that things will go right and according to plan. However, things can go wrong, and when they do a specification has an important role, which some respondents recognised:

"To define the project and protect the client and oneself from litigation or grievance should the design not be as you intended".

"To protect my clients so that the Contractor gets accurate information and vice versa to protect the Contractor".

¹ www.thenbs.com/reasonstowriteaspecification

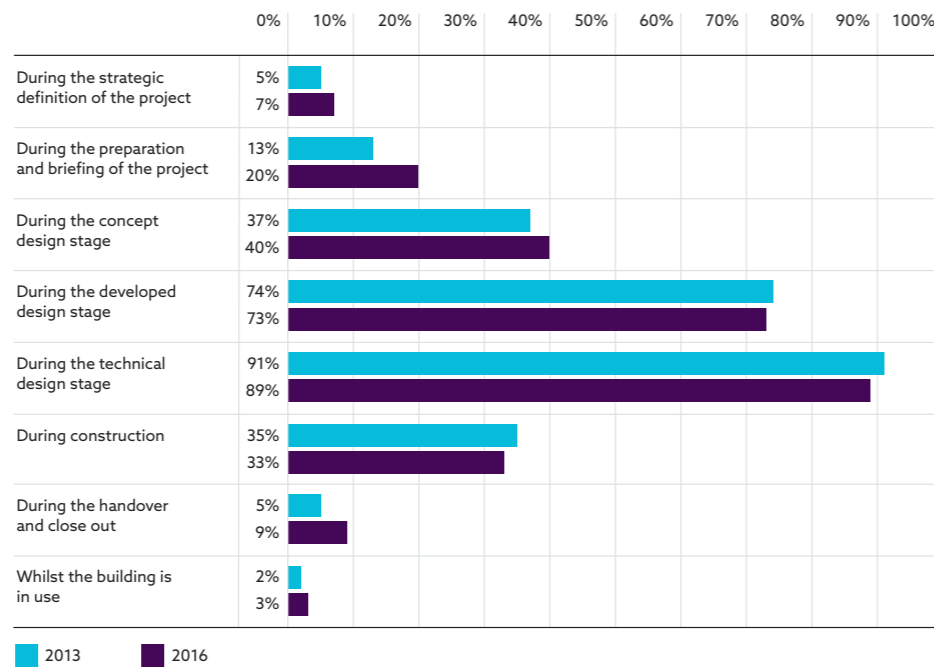
Specification stages and formats

In 2013 we wanted to explore how people wrote and modified specifications throughout the project timeline, from the strategic definition of the project through to the building being in use. We discovered that whilst a small minority were writing or modifying their specifications at both the early and late stages of the project, most were doing this during the developed and technical design stages. As the industry turns to more digital ways of working and looks to encourage the use of Building Information Modelling (BIM) in facilities management, we wanted to understand whether this approach was changing.

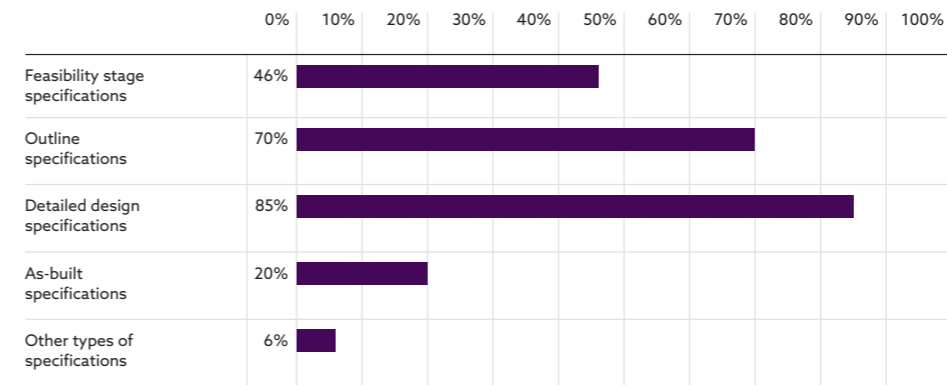
On the whole, this has not changed with the majority of respondents continuing to do much of their specification writing during the developed and technical design stages (Stages 3 and 4 in the RIBA Plan of Work). However, we are starting to see small increases in the percentage of respondents starting the process earlier – during the preparation and briefing of the project (Stage 1) – and continuing this into the handover and close-out. Those working on new build projects are more likely than those working on historic conservation or refurbishment projects to start the specification at an earlier stage in the project timeline.

When a specification is produced will also depend, in part, on what type of specification is being created. Whilst some respondents are creating feasibility and outline specifications, most are creating detailed design specifications. Only one in five respondents are currently creating as-built specifications: you would expect these to be modified in the latter stages by others such as Contractors.

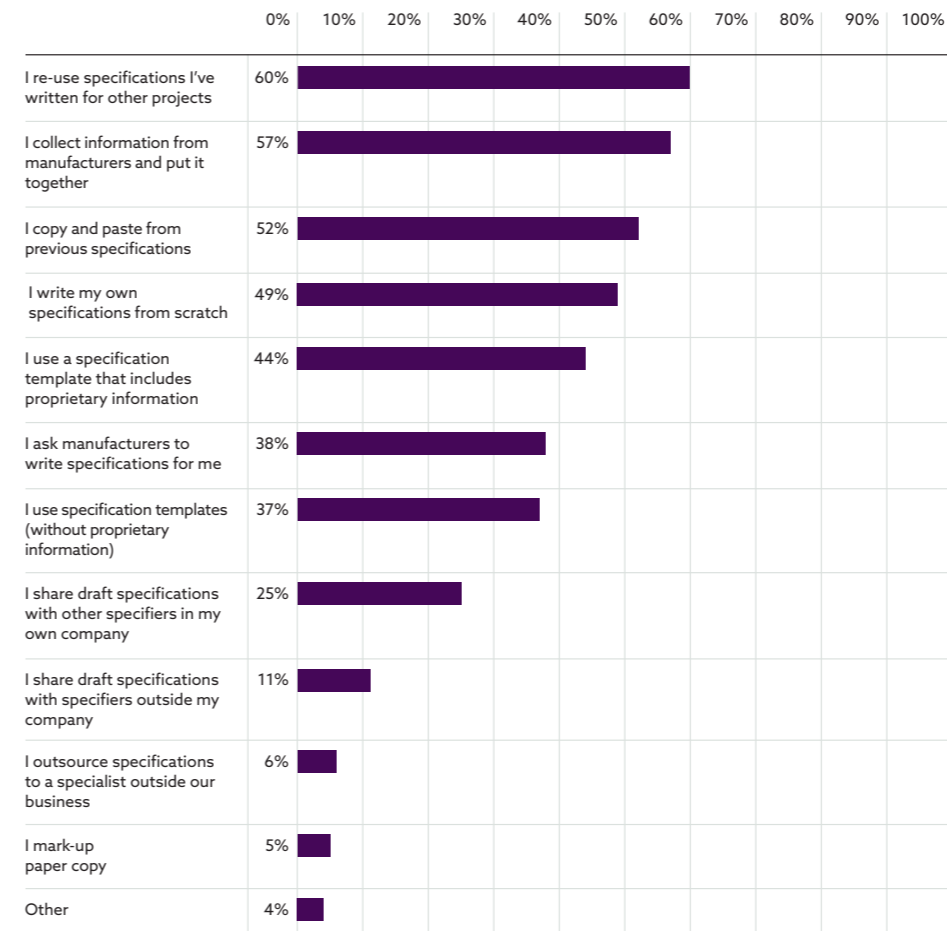
At which of the following stages do you write and modify the specification?



In the last 12 months, which of the following have you or your organisation produced for a project?



When you write specifications, which of the following processes describe how you generally do it?



Specification methods

Those involved in the specification process are specifying in a number of ways: the specifications they produce contain a mixture of descriptive information, proprietary information (naming a specific manufacturer) and performance criteria.

Within the industry, there continues to be a trend for specifiers to 're-use specifications they have written for other projects'. Sixty percent re-use specifications in this way, whilst 52% tell us that they 'copy and paste from previous specifications'. Specifying in this manner presents risks: is the information you are copying up-to-date, does it reflect the current standards or legislation, and is it relevant to your current project? Re-using previous specifications is a practice that is particularly prevalent amongst those producing outline specifications. Positively, though, respondents' 're-use of specifications' or 'copy and pasting from previous specifications' has fallen since 2013 (from 75% to 60% and 66% to 52% respectively). Despite the prevalence for re-using previous specifications, half of respondents do create their specifications from scratch – at least sometimes.

When specifications are shared, there is a tendency to do so in traditional formats.

Product selection

One element of a specification is product selection. The majority of product selection takes place during the developed and technical design stages of a project; though around two-thirds of respondents are starting to think about products at the concept design stage and some even earlier on in the process. When a product is considered, and what product ultimately gets selected, depends on many factors such as how specialist or bespoke the product is and its importance to the overall design (more information is available within our report 'What Specifiers Want 2017'²).

Generally, specifiers are confident in their knowledge and skills in selecting products: 83% are very or quite confident. However, only 28% are very confident; presumably this depends on what it is they are specifying. There will be some products that are common to multiple projects, whilst other projects may require more specialist products or more stringent performance requirements.

Collaboration

For a number of years, collaboration has been a key theme within the construction industry, with many companies forming joint ventures and working with one another on large projects such as the Olympics, the priority schools building programme, HS2 and Crossrail. Given this emphasis on collaboration, you might expect to see a higher percentage of respondents sharing draft specifications both internally and externally, but we are not seeing this yet. Only a quarter are sharing draft specifications with other specifiers within their own company, and less – 11% – with those outside of their own company. However, the number sharing them externally is slowly increasing: in 2013 only 3% did so. Therefore, collaboration is increasing, but it is taking time.

When specifications are shared, there is a tendency to do so in traditional formats. The majority of respondents (88%) send a PDF version via email, and 44% continue to provide a hard copy. However, some are now starting to utilise an extranet or similar file-sharing system. Fifty percent of respondents told us they share specification documents in this way; these tended to be specifiers from medium (employing 16 – 50 people) or large (employing 51 or more people) practices.



Attitudes towards specifications

What a specifier needs to include in a specification varies between projects and depends on a number of factors. There is often a continuum from those projects where specific manufacturers or products are explicitly requested by the client and need to be included within the specification, through to some public sector projects where the naming of manufacturers is prohibited. Therefore, in the latter case, they must leave the selection of products to the Contractor and can only set the criteria for those products, such as how they should perform, their dimensions or design aesthetics. We also know from other research that design and build contracts, where a lot of product decisions tend to be left to the Contractor, have increased in recent years. So it's not surprising, perhaps, that 77% of respondents say that it's important to be able 'to set out performance requirements that

enable a Contractor to select appropriate systems and products at a later stage'. Many also value templates to help guide them through the process. Creating Office Masters is one way to achieve this.

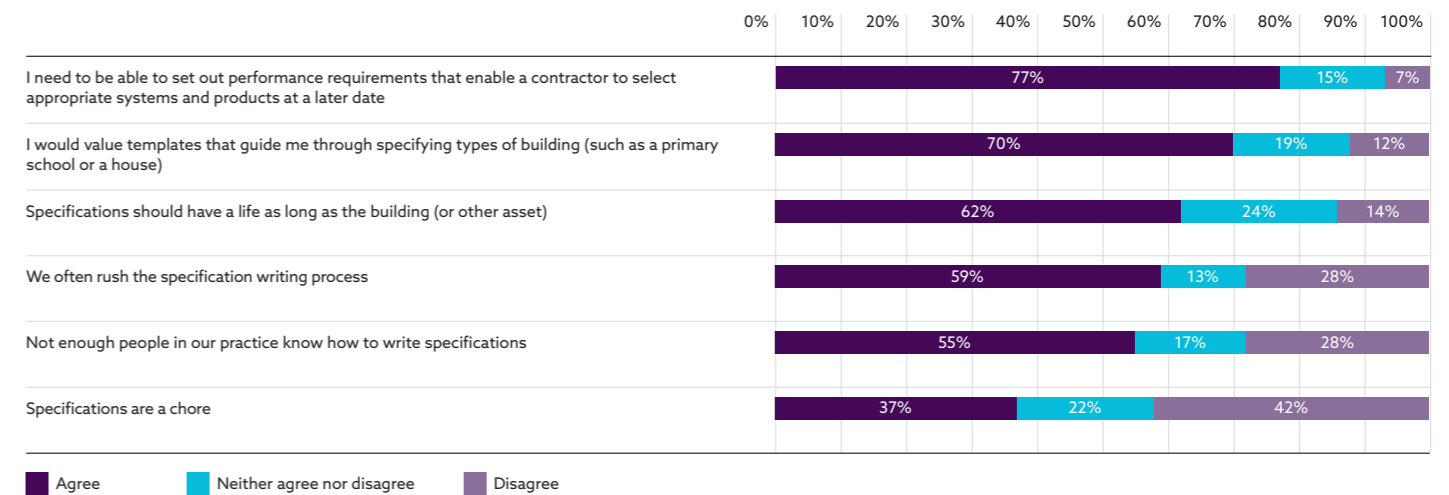
In the past, specifications have too often been seen as one of the less interesting aspects of a construction professional's role, something that people 'pick up how to do', and are left until the last minute. We wanted to find out if these perceptions still exist.

Fifty-nine percent of respondents agree that they 'often rush the specification writing process': a huge risk when you consider the multiple roles of a specification. It may also explain the prevalence for re-using specifications written for other projects as many may consider this a quicker approach, but one which could lead to costly mistakes.

Having said that, perhaps a lack of knowledge about writing specifications is also to blame: over half of respondents (55%) agree that 'not enough people in their practice know how to write specifications'. This is a view more commonly held by those starting out in their career (those aged between 18 and 34).

Whether specification writing is considered a chore is a more contentious issue. Our respondents have very contrasting views: 37% agree that they are a chore, whilst 42% disagree. It seems that specifications are either something people enjoy doing, or they are viewed as a necessary evil.

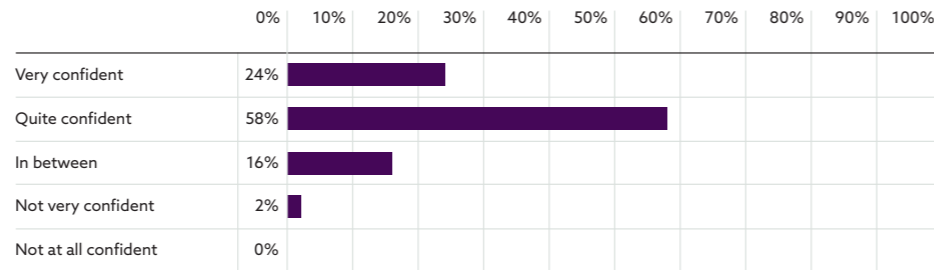
How strongly do you agree or disagree with the following statements?



² www.thenbs.com/whatspecifierswant17

82% of specifiers are very or quite confident in their specification writing knowledge and skills.

Overall, how confident are you in your knowledge and skills in producing specifications?



Our 2013 survey suggested that younger respondents in particular were less confident in their ability to produce specifications. We wanted to take this opportunity to explore specification writers' confidence in more detail. We found that 82% of specifiers are very or quite confident in their specification writing knowledge and skills. However, less than a quarter are very confident.

Confidence varies greatly between groups. Younger respondents, aged 18 – 34, are less likely to be very or quite confident: only 63% of respondents in this age range tell us that they are very or quite confident in producing specifications. Confidence levels increase as the respondent gets older, with 92% of those aged over 55 telling us they are very or quite confident. The lower confidence level among younger respondents is a concern. The industry is already seeing a skills shortage as more experienced construction professionals start to retire or leave the profession. As an industry, we need to ensure that we help and support these younger respondents to enable them to create robust specifications and become more confident in their abilities.

Generally, when people are less confident, it seems to stem from a lack of experience in the area. It is documented that this is not a topic that is taught at university – and some feel that it shouldn't be – but without that practical experience, those coming into the industry need more guidance to help them:

“Only a trainee currently, so once I have produced more, then will hopefully be more confident! More guidance notes would also help.”

Those creating detailed design or as-built specifications, where the various decisions about a project (the materials to be used, workmanship, and the like) are more likely to have been made, are also more likely to be confident in their specification skills. The tools specifiers use to create specifications can also affect their confidence. Those using NBS (which includes guidance) are more likely to tell us they are confident.

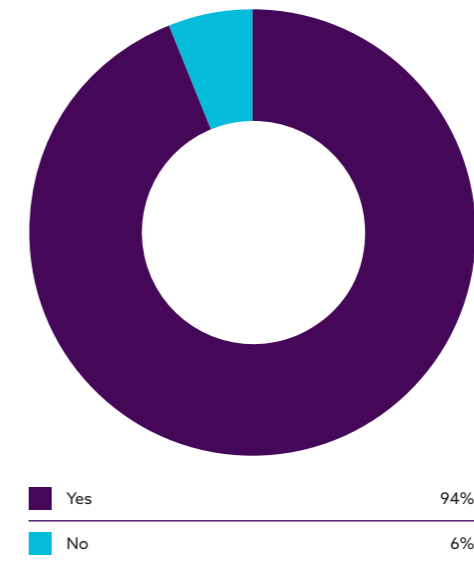


Barriers to producing or using specifications

Despite specifiers' high confidence levels in their ability to produce specifications, it is not uncommon for difficulties to occur when producing or using them. Ninety-four percent told us they had experienced difficulties when producing or using a specification; more than in 2013 when just fewer than nine out of ten respondents (87%) had encountered difficulties. But what causes these issues?

The main reason for difficulties in producing or using specifications is specified materials being substituted; 57% cite this as the main cause of difficulties that they have experienced. This is nothing new: substitution was also the number one cause of specification difficulties in 2013. We also know from other research that this is an issue which frustrates all those involved in the design process. The specification is an important means of achieving design intent on a project, and product substitution can jeopardise it.

Have you experienced difficulties when producing or using a specification?

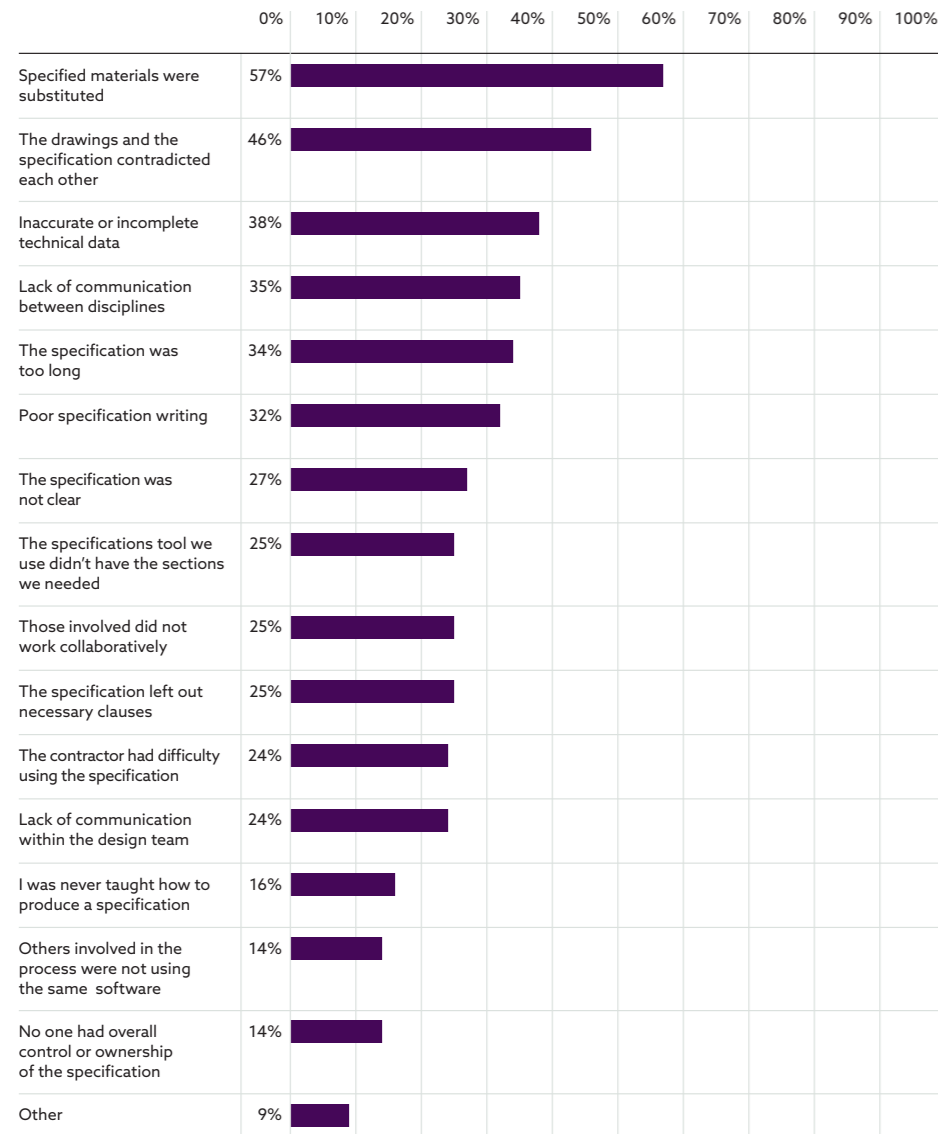


92% told us they had experienced difficulties when producing or using a specification.

The main reason for difficulties in producing or using specifications is specified materials being substituted.



Causes of specification difficulties in 2016



A number of respondents also experienced issues with the drawings and the specification contradicting each other (46%). It is perhaps not surprising that this is a common issue: the frequent changes that need to be made to specifications create a high potential for contradictions to occur between the specification and the drawings. However, tools such as the NBS plug-ins for both Autodesk® Revit® and Graphisoft® ArchiCAD® are available to help simplify the process of putting together a coordinated set of drawings that complement the specification.

The third most common cause of specification difficulties was inaccurate or incomplete technical data (38%). On a positive note, difficulties caused as a result of inaccurate or incomplete technical data have decreased since 2013 when nearly half (49%) raised these issues. However, it is still a concern that these issues cause so many difficulties when people are producing or using specifications. In part, these issues may continue to be influenced by the practice of re-using specifications from previous projects. When using this approach, there is no guarantee that the information originally used will still be current.

At NBS, we offer a number of tools to help specifiers access standards, manufacturers' product data and other information. We also help manufacturers to provide up-to-date product data. Ensuring accurate and up-to-date technical data is becoming increasingly important as the industry continues to adopt BIM and encourages the use of such models and information by facilities and asset managers.

For a third of respondents, the difficulties were caused by poor specification writing (32%). Two other causes are perhaps linked to this: *'the specification was not clear'* (27%) and *'I was never taught how to produce a specification'* (16%).

To ensure that a specification helps to achieve the original design intent, it is important to ensure that the specification is not forgotten about: that enough time is devoted to creating and developing it. It also needs to contain all of the necessary information, setting out the required performance criteria. We must also ensure that those entering the profession are supported and provided with the skills and experience they need to produce a robust specification for their projects.

Collaboration can also cause difficulties, as it did in 2013 for four out of ten respondents (39%). The latest survey has again shown signs that the industry is getting better at collaboration. In 2016, the percentage of respondents citing *'those involved did not work collaboratively'* as a cause of the specification difficulties that they experienced, fell to 25%.

The future of specifications

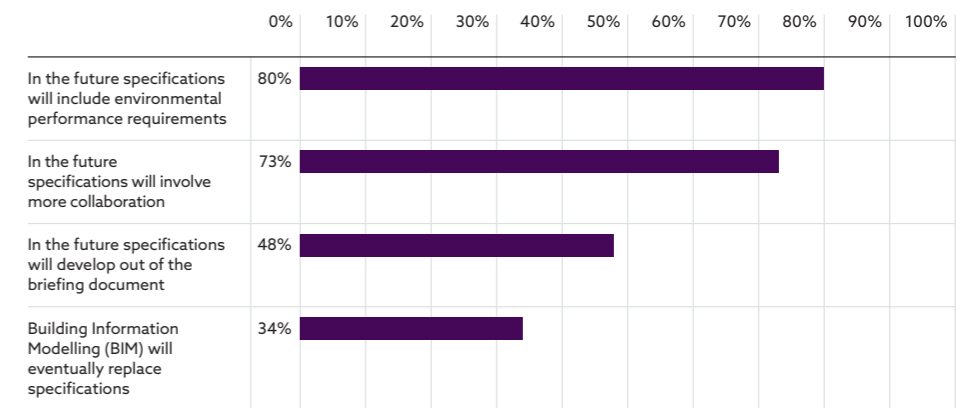
The construction industry, like many others, is increasingly looking at and adopting digital ways of working. We wanted to understand what this means for specifications: what will they look like, how will they develop, and will they still exist?

As BIM develops and more companies adopt it, questions have been raised about the specification's relationship to the model, and whether BIM could eventually remove the need for specifications. It is clear that for many respondents the two will work alongside each other: only a third (34%) agree that BIM will eventually replace specifications.

Whilst the number is low, it is still a concern that as many as 34% believe this may happen. The information contained within a specification is essential for setting out the requirements of a project: the products, workmanship and quality to be used. This information will always be an essential component of the model.

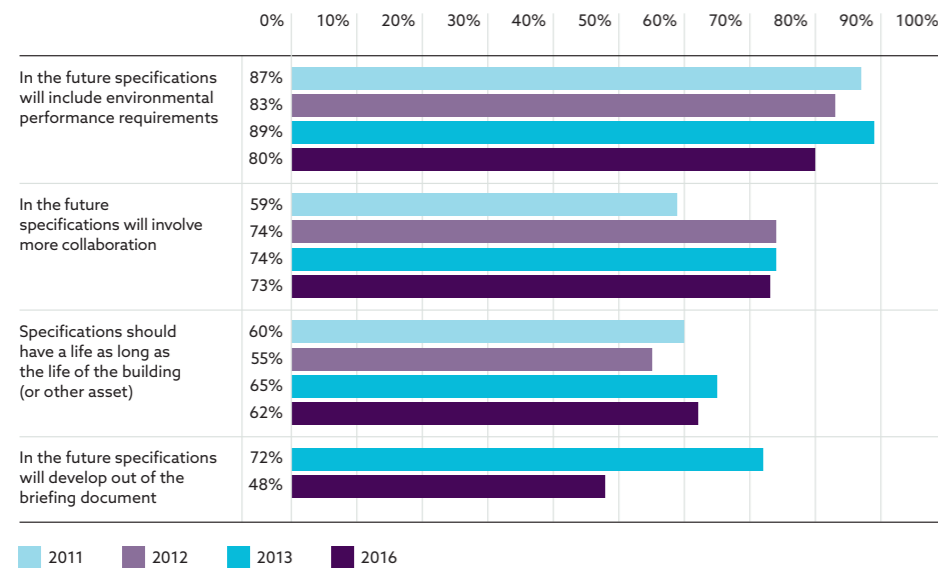
Another element of BIM is collaboration. Nearly three-quarters of respondents believe that in the future specifications will involve more collaboration. Perhaps increased collaboration on the model will lead to the same on the specification itself.

The percentage of respondents who agree that...



Ensuring accurate and up-to-date technical data is becoming increasingly important as the industry continues to adopt BIM and encourages the use of such models and information by facilities and asset managers.

Percentage of respondents who agree with the following statements



Over the time that we have been running this survey, there have been few changes in respondents' perceptions of what future specifications will look like and how they will develop. Many respondents continue to think 'future specifications will include environmental performance requirements', and expectations of collaboration have been consistent since 2012. A similar percentage of respondents are also firm in the belief that 'specifications should have lives as long as the life of the building (or other asset)', though this has yet to become a reality.

Perhaps surprisingly though, the percentage who believe that 'in the future specifications will develop out of the briefing document' has fallen substantially from 72% to 48%. A project's brief should always have a firm link to the specification, and ultimately the final building or asset. Perhaps this can be explained by the number producing feasibility and outline specifications, as well as the increase in people producing specifications at an earlier stage. These people may now see the process as seamless rather than involving separate documents. It could also be that for some this is not in the future, it is now:

"The two statements 'In the future specifications will develop out of the briefing document' and 'In the future specifications will include environmental performance requirements' were misleading... We believe both these statements are already true".

However specifications may or may not change in the future, it is clear that specifiers need and want there to be easy links between the specification itself, legislation and standards, and manufacturers' product information:

"You could help by increasing the database of manufacturers and their associated standard specifications for integration into NBS software. This avoids mistakes from misinterpretation by the person developing the specification".

This is something that we are doing here at NBS and will continue to develop and improve.

Closing remarks

When we last ran the specification survey in 2013, we found that the construction industry was in a period of transition – moving from traditional ways of working and specifying to using BIM. Over three years have passed since that survey. When embarking on our latest survey, in 2016, we wanted to know what effect, if any, the changing construction industry has had on specifications in that time: to understand what place specifications have in a digital construction industry.

It is clear that specifications have a vital role in the construction industry, irrespective of the type or size of project. They are created for a range of reasons, most commonly to set out expectations and performance criteria for a project. Some specifiers also recognise the contractual role specifications have and the part they play should things go wrong on a project: perhaps a reflection of the increase in respondents experiencing difficulties when producing or using specifications. Primarily, such difficulties were a result of product substitution, contradictions between the specifications and the drawings, and inaccurate or incomplete technical data. It is disappointing to see inaccurate or incomplete technical data still among the common causes of difficulties, but we are making progress. Fewer respondents raise it as an issue than did in 2013. Here at NBS, we offer a number of services to help provide accurate technical information and data, and will continue to improve and promote these to help reduce this difficulty further in the future.

We found that specifications continue to be written and edited throughout the project timeline, giving acceptance to the concept of a lifetime specification. Despite the majority of specification writing occurring at Stages 3 and 4 of the RIBA Plan of Work (during the developed and technical design stages), we have witnessed a small increase in those starting the specification earlier on in the process, particularly at Stage 1 during the preparation and briefing of the project. As an industry we are moving towards a lifetime specification, but this is still several years away.

There is a continuing tendency for specifiers to re-use specifications created for other projects, or to copy and paste from other projects. At NBS we would urge caution here: using these methods risks introducing out-of-date, inaccurate or (at times) irrelevant information. However, many also rely on help and support from manufacturers, asking them to provide the information or clauses that they need.

It was important to understand specifiers' attitudes towards specifications. On a positive note, the majority are confident in their knowledge and skills in producing specifications. But we still need to support those entering the industry. We need to give them guidance and support to help them create robust specifications and ensure that they feel like they know how to do so. We also need to ensure that sufficient time is spent on these important documents: three out of five respondents tell us that they often rush the process. There has often been a perception that specifications are one of the less interesting elements of a construction

professional's role, but is that true? It's a contentious issue. For 37% it is a chore, but for 42% it isn't. Our respondents see the value of specifications, even if they don't necessarily enjoy the process of creating them.

April 2016 saw the Government's mandate for the use of collaborative BIM in all centrally procured publicly-funded projects. We know that collaboration can mean different things to different people, but as an industry, we are striving to create an environment where at least two parties co-own and co-create the specification. Results from the survey demonstrate that we are making progress towards this, but it is slow. However, there is still an expectation from three-quarters of respondents that collaboration will increase in the future. More concerning is the belief held by 34% of respondents that 'BIM will eventually replace specifications'. The information contained in a specification is essential to the information model.

The construction industry has not yet completed its transition to a truly digital way of working. It will be interesting to see in coming years how this transition continues and what it means for specifications.

View from the industry



Stewart Lunniss
Architect and
Principal, Leander
Design architecture
+ interiors

Stewart is an architect with 20+ years' experience working in private and public practice and client side for a developer, with experience of overseas projects for the Foreign & Commonwealth Office. Now setting up as a sole practitioner with interest in the diplomatic sector.

email stewart@leander-design.com



The survey findings provide us with a good understanding of the industry's experience of specifications and what they expect in the future. Comments made by many respondents show that it is clearly an important topic to them; so we asked four people working in the industry to share their experiences of specifications with us in more detail.

We start with Stewart Lunniss (Leander Design architecture + interiors) who describes his first thoughts on seeing an NBS specification and how these changed once he experienced other ways of producing specifications.

Personal experience of specifications

My first exposure to NBS was at university – such an off-putting experience! It left me living in dread of the day that I would be asked to 'write up the spec' when in practice. A few years passed and the day came when I inherited a dormant project... the format seemed familiar, but where were the completed clauses? F40 & M60 missing? Yes, lots of blanks where my predecessors had skipped clauses or left numerous pages without editing: a situation I found all too familiar in other practices.

I did not set out to be the NBS 'geek' in practice but have found myself being the NBS 'champion' over the past 20 years, whether in practice or client side. I sought to deliver quality outcomes for clients and end-users alike; to have a contract document that ensured the contractor executed the project to recognisable and measurable standards.

I learnt that the best way to start writing up the project specification is to start early and fill in clauses as the design develops: anything to avoid that daunting cliff face with one month to go until tender issue – we have all been there!

I learnt that the best way to start writing up the project specification is to start early and fill in clauses as the design develops.

For colleagues who dread specification writing, I often state that NBS acts as an 'aide-mémoire'. On one of my early projects, the omission of door seals across 70 apartments was a costly variation for the client. Conversely, a contractor seeking a variation for additional profiled skirting was referred to the clause that stated 'ogee profile'... such a relief for me as the architect and specifier.

Amusingly, one quantity surveyor considered NBS 'top-heavy' and discouraged a competitive tender return – my view is that any contractor not willing to review the specification is best avoided.

Technology, the internet and the user interface of NBS Building and Scheduler have evolved to make specification writing more pleasurable and a good way of keeping up to date with new products and standards. If there is one criticism, it is that there is too much information just a click away: a diversion from design!



Mark Taylor
Director, Allies
and Morrison

Mark is the director at Allies and Morrison responsible for technical quality, providing knowledge transfer, research and support on construction, sustainability, materials and process. He has particular expertise in building envelope technology, holding a masters degree in façade engineering. He regularly contributes to industry through teaching, lecturing, and working on various industry committees and councils.

twitter [@alliesmorrison](https://twitter.com/alliesmorrison)

Allies and Morrison

Substitution of specified items

Substitution is where a contractor constructs something different from that which is drawn or specified in the Employer's Information Requirements.

Products are the usual targets for substitution, but methods, build-ups and materials are commonly victims of change. This may not all be bad news as long as there are no changes to the visual requirements, the functional requirements or the performance requirements. As long as these three critical aspects of the Employer's Requirements are met, there will be no change to the look, feel and workings of the item being substituted. Notice that requirements of the contract can't be changed without a formal variation to the contract. There is a difference between requirements and the means of achieving those requirements. Substitution has its place within the means, but not in the requirements themselves, unless a variation is put in place.

Common reasons for substitution are as follows:

- 1 Where a contractor may optimise their process in programme, cost or practicality, whilst still meeting the Employer's Requirements. A design and build dry lining contractor may combine specified systems together for simplicity without affecting the Employer's Requirements.
- 2 Where the contractor uses a procurement framework and the specified item cannot be bought through their usual channels.
- 3 If the information in the Employer's Requirements is contradictory or erroneous.
- 4 If a specified product or material is no longer available; an equivalent must be found.
- 5 Sometimes changes made to the project by another part of the works triggers a need for a substitution.
- 6 Where an item is outside the designing consultant's domain of expertise, the specialist contractor would complete the design; but if the consultant has assumed something that cannot be built, an alternative must be found.

The definition of whether a substituted item is in accordance with the ERs depends upon the rules of equivalence stated in the tender documentation, including the specification. Again, if a substitution item is visually and functionally equal, and provides equal certified performance to the specified item, it would normally be equivalent. The original information must therefore communicate precisely both the requirements and the rules of substitution.



David Wigglesworth
Managing Director,
SFS intec

David has over 20 years' experience working for leading manufacturers in the construction industry. This includes 14 years' experience at Managing Director level, of which the last eight years were spent at global leading door-opening solution company ASSA ABLOY. In the latter two years, David defined and led their UK specification capabilities.

David joined SFS intec in March 2016 as Managing Director with full P&L and operational responsibility for the UK Market Region, with a key focus on further strengthening relationships within the company's broad customer base while identifying new market opportunities for mutual benefit.

SFS intec is part of the SFS Group and the world's largest manufacturer of carbon and stainless steel fastening systems for metal and flat roofing, cladding and façade systems. SFS also manufactures high quality hinges and window installation systems.

[www.linkedin.com/
company/sfs-intec](http://www.linkedin.com/company/sfs-intec)

SFS intec
Turn ideas into reality.

Support from manufacturers

Manufacturers need to support architects and designers more. Providing support to designers is not a problem for SFS intec: we're happy to help.

From our perspective, it's important for manufacturers to fully understand the design intent of a project in order to advise on the best products to achieve the overall building design and performance required. Even the smallest of components, like the fixings or hinges, can complement or compromise the system chosen whether the attributes relate to the aesthetics, quality or performance of the design vision. Any mistakes or replacements made can be expensive and time-consuming to put right or repair, and although substitutions may reduce capital expenditure costs they may significantly increase operational costs and/or durability over the building's life cycle, straying away from the original design intent of the build.

At SFS intec, we realise that architects and designers can't know absolutely everything about every component of the build and that's why we have specification and technical teams to understand the variables of each specific project and to work closely with design teams to select the right product for the application. We enjoy providing support to designers and aim to be a 'Design Partner' at an early stage in the specification process.

We also believe that education and a continual cycle of education for designers will help to improve the specification process. We offer a number of RIBA-accredited CPD seminars. But it's also about how we continue to promote the relevance of specification clauses through NBS, ensuring the accuracy of those clauses and specifications, and how we evolve and embrace the development of Building Information Modelling.

It's interesting to note that in the NBS specification survey results, 70% of respondents agree that the process works best when manufacturers are involved at an early stage. We are keen to support the architects in their BIM journey, their education, and in designing out their liability in terms of performance and application. As a manufacturer, we have the global depth and breadth of technical know-how to understand the unique variables that may not be obvious to the specifier, so why not use those advantages to mutual benefit?



Andy Jobling
Technical Manager:
Architect: Principal
Designer (CDM),
Levitt Bernstein

Andrew is an Architect of 30 years' post-registration experience which covers various building types including transport, commercial, industrial, neurological and mental health – and most recently affordable housing, theatres and arts projects. He also has experience of a range of construction methods and materials and procurement strategies.

Andrew holds a Technical Manager role within the practice, providing designated technical support, advice and assistance to the whole architectural staff. He also manages the Quality Management System and training needs of the practice, requiring him to keep up to date with current legislation, regulations, products, materials and construction practice. Responsibility for dissemination of feedback within the practice and development of office master specifications further reinforces his knowledge of construction best practice.

[@levittbernstein](https://twitter.com/levittbernstein)

Levitt Bernstein
People.Design

Evolving specification practice 2017

Specification is becoming more complex, and those who specify have less opportunity to gain the skills required.

Vernacular architecture is an evolution of materials and details that are known to perform, and are familiar to designers and builders alike. Contemporary architecture uses new materials and highly engineered systems, and often uses familiar materials in novel ways where their applications are tested to their limits. This approach is coupled with procurement options, such as design and build, which actively discourage designers from attending site where they would gain a hands-on knowledge of how systems and components are assembled and installed. There is, therefore, a heavy reliance on the supply chain side to assist designers to achieve the necessary performance levels and their design intent.

Whilst manufacturers are aware that it is in their interests to ensure that their products are correctly specified and installed for the long-term sustainability of their businesses, the designer/specifier should nonetheless be critical of information that they are offered by them, and should be able to strengthen the requirements in the specifications they produce. As no individual can be an expert across all fields of the specification, there is a need for access to the accumulated knowledge and experience of the particular practice and the industry as a whole. Online information systems and company intranets are useful tools, but guidance at point-of-use is most effective. One of the strengths of NBS' specification software is that it not only provides us with

comprehensive guidance from their technical authors, but importantly it allows us to embed our own guidance, which is offered to the specifier when they need it without any searching on their part.

At Levitt Bernstein, we create opportunities for our specifiers to visit construction sites and completed buildings to evaluate and learn about the products and systems that they are specifying. However, whilst this builds their technical knowledge, there is a real need for some training that would assist them in putting together a robust specification. One company did float the idea of a specification-writing course with BRE a few years ago, but the recession intervened. Perhaps now is the time to revive it.

With BIM comes new opportunities. The specification is no longer just a tool for communicating and controlling the quality and durability of the building during construction, but now has an extended life as an asset management tool – and a very powerful one if linked to the spatial model through BIM. Not many clients have yet realised the longer term value that they have in the specification. In future, I think we will see the specification as an active document that evolves from the brief, is extended through the design stages, and is further updated during construction, before being handed over to the client to manage the asset. However, as construction remains a disparate industry with many players, there will need to be clear demarcation of design responsibilities along the lines that we are now seeing in the BIM Execution Plans. In future, the specification will be a key deliverable on all construction projects.

Powerfully connected specification software.
Part of the NBS solution for BIM projects.

- Produce outline, performance and full specifications
- Pre-written clauses for over 1,000 systems and 20,000 products
- Seamless co-ordination between model and specification
- Access to expert guidance and the latest regulations and standards

theNBS.com/nbs_create



Meet the team writing NBS

At NBS, we have a technical team which authors NBS specification products, and whose members are available to help discuss with customers usage of these tools in specification writing. The team members' backgrounds are diverse, with many years of experience working in the construction industry and producing their own specifications. We wanted to introduce you to some of the team, as they share their specification experiences with you.



Alan Murray
Technical Coordinator – Civils/Landscape/Structural

The team members' backgrounds are diverse, with many years of experience working in the construction industry and producing their own specifications.

Tell us a bit about your role

I am the NBS Technical Authoring Co-ordinator with overall responsibility for all civil, structural and landscape architecture technical content. I use the experience and skills that I gained through practice to author content that supports projects covering a wide range of disciplines and scales.

I have designed structures using most conventional building materials and processes, and have either personally designed or led design teams in producing overall building and structure designs, as well as preparing technical specifications which would be used as contract documents. I have also produced reports on building or structural defects and proposed appropriate remedial actions.

What do you enjoy most about your role?

I particularly enjoy dealing with a variety of subjects, producing relevant and useful information to improve and expand upon the content which we produce to support civil engineers, structural engineers and landscape architects.

I have worked for contractors and consultants on a diverse range of projects, including earthworks, site remediation, tunnels, power stations, multi-storey reinforced concrete framed buildings, steel framed structures and masonry buildings.

Where did you work before joining NBS?

By profession I am a Chartered Civil Engineer. I have 44 years' experience in design, specification, project management, site supervision, business management and business development across all disciplines in both the public and private sectors.

When you were in practice, how did you feel about writing specifications?

Specifications are a fundamental part of contract documentation and are essential for the communication of information about any proposed construction project. When in practice, I did not treat writing specifications as a separate task, but rather as an integral part of the design process.



Roland Finch
Technical Coordinator – Preliminaries

There are different types of risks in construction projects; these can be expressed in terms of time, cost and resources.

Tell us a bit about your role

I am the principal author for NBS Preliminaries and Project Management content. That means keeping up to date with all the various construction contracts and their associated documents.

I have also written many articles on a variety of health and safety topics, and contribute to a variety of journals and other information services such as 'Croner's Management of Health & Safety'. I also wrote the 'NBS Guide to Tendering for Construction Projects' and co-authored 'BIM for Construction Health and Safety', both published by RIBA Publishing.

What do you enjoy most about your role?

I particularly enjoy finding solutions to subscribers' problems and sharing my expertise and experience with others.

Where did you work before joining NBS?

I am a Chartered Quantity Surveyor with over 35 years' construction industry experience in both the public and private sectors. I have worked on large and small projects all over the UK and beyond.

How can specifications help to reduce risk?

There are different types of risks in construction projects; these can be expressed in terms of time, cost and resources. A clear specification can help everyone involved in the project to identify those risks, and make sure that they are allocated to the people best equipped to manage them.



Michelle Lucarelli
Architect/Chief Editor

Tell us a bit about your role

I joined NBS 11 years ago, initially as a Technical Author, before taking up the Chief Editor post last year. I now lead the editorial team, setting and maintaining quality standards for written technical content of NBS specification tools. We work alongside the whole technical team, looking at relevance, currency, robustness, risk and usability of NBS specification tools. We also contribute to NBS' wider content strategy.

What do you enjoy most about your role?

Working with the other construction professionals in the technical team: sharing thoughts, ideas, and conclusions on how to offer meaningful products for the construction industry. Healthy debate backed by research and evidence, investigation, listening to customer (and non-customer) views, testing, and drawing on both experience and fresh ideas are all key.

Where did you work before joining NBS?

I spent 18 years in large local government multi-disciplinary construction design teams, working on projects from inception to completion, having the fortunate opportunity to engage with all parties throughout the process, including project sponsor, client, design team, contractor, end-user and maintenance team. Schemes included social and commercial standard and assistive housing, pre-school, primary, secondary and tertiary education provision, listed civic buildings, multi-purpose community provision etc. using traditional, direct labour, design and build, and partnering contracts.

Can specifications help to achieve design intent?

Yes, definitely. The idea that a specification can lock down the means of manifesting that intent is a basic premise: even in the most collaborative of scenarios it's still possible to misinterpret an idea, and so reducing ambiguity is vital. The skill is in allowing the specification to be accessible (it needs to be understood by the whole chain) as well as flexible (change happens), and when it is well done, it should inspire confidence in all parties.

We work alongside the whole technical team, looking at relevance, currency, robustness, risk and usability.



Donald Duncan

Technical Coordinator – Building Envelope

Typical specification-related problems include lack of clarity and specification structure, leading to inappropriate product substitution... I found that using NBS products provided solutions to these problems.

Tell us a bit about your role

I joined NBS in September 2013, and am the Technical Authoring Coordinator responsible for the team covering the Architectural Exteriors content. My own content responsibility focuses on masonry systems, products and related sections. On a typical day, I will attend stand-up meetings to discuss and plan upcoming content releases, support team members with content authoring and quality assurance, and coordinate work and resolve issues with other teams in the business.

What do you enjoy most about your role?

I naturally gravitate towards simplifying the complex. I enjoy finding innovative solutions to complex problems, specifically those affecting customers; also helping others to understand internal tools and processes, and exploring better ways of working collaboratively.

Where did you work before joining NBS?

I studied Architectural Technology at the Robert Gordon University in Aberdeen, including six months of study in Copenhagen, Denmark. My first architectural role was in private practice in Edinburgh in 2004. For seven years I worked on a wide range of projects, from small domestic extensions to multi-million-pound nursing homes and flatted developments. In 2013 I started my own practice, managing projects from inception to completion for third-sector and domestic clients.

When you were in practice, did you experience any problems when writing or producing a specification?

My experience of working with specifications on multi-disciplinary projects in practice has been invaluable for my work at NBS. Typical specification-related problems include lack of clarity and specification structure, leading to inappropriate product substitution due to 'value engineering', and severely limited time being allowed for composing specification data. In practice I found that using NBS products provided solutions to these problems, so I am proud to now be contributing to this valuable resource.



Bill Clark

Technical Coordinator Engineering Services

Tell us a bit about your role

Understanding the difficulties faced by contractors when receiving construction information (which often contains duplication, contradiction, superfluous information, or is incomplete) enables me to provide detailed clause content and guidance. This is based on research of standards, codes of practice etc., with the aim of creating robust technical content. My aim is to simplify the task for the specifier when creating project specifications, helping them to achieve the necessary balance between including essential content, and ensuring that it is clear, up-to-date and consistent.

What do you enjoy most about your role?

Training and coaching staff.

Where did you work before joining NBS?

A Regional Electricity Distributor before working in a General hospital and then with a consultancy.

What one piece of advice would you give to someone new to writing specifications?

Having been responsible for designing, maintaining and managing the budget of substantial property estates, I'd advocate giving priority to designing systems that can be easily built, maintained and are cost-effective to operate throughout the lifecycle of the building. The development of clear and concise specifications and drawings maximises the potential for a building's services to operate in accordance with the design intent. Production of design information, including specifications, is something that benefits from standardisation (in the form of an office master and easily accessible design office practice notes) and an iterative approach to improvement, using lessons learned from previous projects to improve upon the next.

As the shortage and quality of skills within the construction industry becomes increasingly severe, the need for an appropriate level of inspection becomes ever more essential, both during the build process and at handover in order to protect the client's and/or the building user's interests, as does the importance of enforcing the contractor to comply with the specification.

My aim is to simplify the task for the specifier when creating project specifications.



Phil Simpson
Technical Coordinator – Building Internals

Future specifications will become simpler and more intelligent. They will link seamlessly between models.

Tell us a bit about your role

I joined NBS in 2015 as a Technical Author within the Architectural Interiors team. I am responsible for sections including fire protection, doors, stairs, sanitaryware and paint. A typical day involves talking to customers who have specification queries, researching the subjects and checking any standards that may have been changed, and challenging the existing software, looking at ways that it can be improved for the user.

What do you enjoy most about your role?

I like to lead from the front and enjoy being part of the team with answers to the problems, and getting things done. One of the reasons I wanted to join the NBS team was to be part of something that the industry respects.

I particularly enjoy carrying out research into new technology and new developments in construction industry products and practices, meeting manufacturers and getting a different perspective on NBS products.

Where did you work before joining NBS?

Before joining NBS I worked in private practice for 15 years as Senior Technician and Associate. I specialised in education and healthcare projects, with involvement in design, technical detailing and project management. During that time I developed the architectural practice by looking at marketing and public relations, expansion, practice policies and procedures.

What do you think future specifications will look like?

Future specifications will become simpler and more intelligent. They will link seamlessly between models; information will be input once and seen everywhere. I think it will become one of the most important parts of BIM: the link between the brief, the contract, the drawings and the build phase will be one. It should be the document that forms part of the Asset Management tools and the next phase of how the building is used, how the assets are managed and how the building can be disposed of if required.



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Hand the model over to those maintaining the built asset who will benefit from the populated facilities management properties contained within the standardised NBS BIM objects

theNBS.com/BIMworkflow

The legalities behind specifications



Sarah Wilson
Partner, Watson
Burton LLP

Sarah has specialised in providing market-leading legal advice to the construction and engineering sectors for more than 17 years. She has dealt with a wide range of heavyweight large value engineering and construction projects in both contentious and non-contentious areas.

Sarah's expertise has seen her provide advice to local and national clients on contentious matters covering dispute resolution on all major forms of construction contract, and which include defective piling, waste to energy, oil and gas, sea defence work, port and harbour work and housebuilding. She has also advised on non-contentious matters such as waste to energy plants, factory fit-outs, electricity plants, port and harbour contracts, utilities framework contracts and student accommodation.

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The majority of respondents to the NBS specification survey told us that they have experienced difficulties when producing or using specifications. Not all of these difficulties will result in disputes, but some might. In fact, in 2015, 44% of those responding to the NBS Contracts and Law survey¹ had to deal with at least one dispute within the last year. Sarah Wilson and Bal Manak, from leading law firm Watson Burton LLP, explore the role of a specification as part of a construction contract.

The Fundamentals

A construction contract will usually be made up of the following documents:

- 1 The contract (legal document).
- 2 The terms and conditions (legal document).
- 3 The specification (technical document).
- 4 Ancillary documents, such as collateral warranties, bonds, parent company guarantees (legal documents).

These documents work hand-in-hand and are all legally binding. The specification states what the contractor builds, whilst the terms and conditions address what happens if the work does not go to plan (for example, defects, delays, variations). Here are some good and very simple examples of how these documents operate in practice:

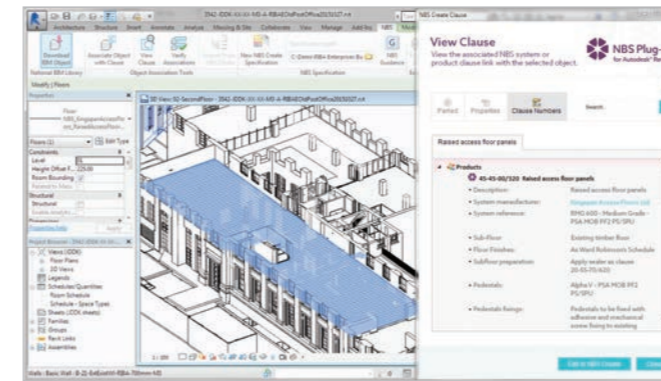
- 1 Variation payments to a contractor – if the specification changes at the request of the employer, the terms and conditions will usually require the employer to pay the Contractor for this.
- 2 The specification will usually state the tests that the employer wishes to carry out and when. Failure to comply with this requirement will usually mean that the Contractor is entitled to additional payment via the terms and conditions.

Typically you would expect to see a clause (in the terms and conditions) specifying the priority of each of the documents, and usually they would be in the order as set out above. The purpose of this is to deal with any ambiguities within the documents or between them.

When negotiating contract terms and conditions for a client, we always prefer to see any specification. This avoids any items being included in the specification which conflict with those being negotiated elsewhere by the lawyers.

Potential issues which can arise from a specification are:

- Incomplete or ambiguous terms.
- Duplication or contradiction of contract terms and conditions.
- Incorrect terminology and referencing (such as JCT-type specification used for NEC project).
- Specifications drafted from 'scratch' (which risks something being missed) or cut and pasted from other specifications.
- Specifications prepared without reference to contract guidance notes on what the specification should include.



Extract from typical NBS
Create specification using
NBS Revit plug-in

What information should the specification contain?

The specification should include technical information on what the Contractor is required to provide, including measurements, quality, requirements to work with others, plans and drawings.

Different forms of construction contract require different information to be provided in the specification, and examples are set out below.

NEC3

The NEC form of contract includes a specification as the Works Information ('WI'). WI is defined as:

- "... information which either
- specifies and describes the works; or
 - states any constraints on how the Contractor provides the works; and is either
 - in the documents which the Contract Data states it is in; or
 - in an instruction given in accordance with this contract".

The WI will often be an extensive document, and some of the key issues to be covered within it are:

- 1 Description of Works – a general outline of the scope of the works to be done. This may include the Employer's overall objectives so that the Contractor can understand and work towards these.

- 2 General constraints on providing the works – any restrictions on access, sequences of construction, working hours etc.

- 3 Contractor's design – identifies the works that the Contractor is to design. The Employer's requirements should be set out (for example specifications, design standards and codes of practice, size and space limitations).

- 4 Completion – states clearly and unambiguously what work is to be done before Completion so that the project manager can decide that Completion has occurred. Alternatively, a statement identifying works which can remain incomplete at Completion.

- 5 Tests and inspection – which tests and inspections are required, who is to be involved in the process, and who is to provide the materials, facilities and samples.

- 6 Health and Safety – any health and safety requirements for the project, in addition to the requirements of the law.

- 7 Subcontracting – any restrictions on the Contractor's ability to subcontract work.



Bal Manak
Associate, Watson
Burton LLP

Bal has over 10 years of non-contentious construction and engineering experience advising on building contracts, appointments, warranties and other security documentation. Bal acts for a diverse range of clients including employers, private developers, building contractors, consultants and funders in relation to housebuilding, procurement, development finance, healthcare, student accommodation, care homes and commercial developments. Bal places a huge emphasis on client care and service delivery, and assists these clients at every stage, from planning and project inception to project completion. She is able to offer support for unexpected problems that arise post-completion.

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¹ www.thenbs.com/contractsandlawsurvey15

In practice, the Brief is often a working document which is developed by the Architect/Consultant to produce a fully compliant and tested design.

JCT

The specification for JCT is known as the Employer's Requirements ('ER'). The ER provides a description of the client's requirements formed from the specification for the building, the scope of services required, and an allocation of risk for unknown items. The Contractor then prepares the Contractor's Proposals in response, detailing how the building will be designed and constructed in accordance with the ER.

The JCT contracts do not prescribe what must be included in the ER, but the Contractor must comply with it, so it is important that it is drafted with care. It is also important that any inconsistencies between the ER and the Contractor's Proposals are negotiated, and the relevant specification amended to incorporate these negotiations. Once the contract has been entered into, it is not clear which document takes priority, so there should be no discrepancies between them.

The ER may only contain basic information which the Contractor is to develop in its Contractor's Proposals, or it may be very detailed, leaving little scope for change in the Contractor's Proposals. Nevertheless, the more prepared, clear and precise it is, the less likely it is that there will be disputes. There will be less room for disagreement over what the Contractor was instructed to do, and it will be less likely that the employer will have to instruct a Change on the basis that it is not clear whether the additional work that the Contractor was instructed to do was part of its original scope or not. The ER is therefore a fundamental document, and employers are advised to seek the assistance of a qualified project manager to help them to draft this.

Consultants' forms of appointment, such as RIBA, ACE

The principles regarding the status of the specification in a consultant's appointment are not dissimilar to those contained in construction contracts.

In the RIBA and ACE appointment forms, it is known as a 'Brief' which describes the Client's requirements, supported by other information and drawings. In practice, the Brief is often a working document which is developed by the Architect/Consultant to produce a fully compliant and tested design. In addition, the Brief is accompanied by a 'schedule of services' setting out, in more detail, those services which the Architect/Consultant is to provide.

End note

In summary, therefore, the specification is a key document in the construction process. Where it is included as a contract document, it has legal status, and is critical to the success or failure of the project. It is clear that the specification should not be ignored, or the consequences could be severe.

The Report of the Independent Inquiry into the Construction of Edinburgh Schools², published on 9th February 2017, makes this plain: the Report was commissioned by the City of Edinburgh Council following the collapse of a wall at Oxbgangs Primary School and the subsequent closure of 17 schools. One of its principal recommendations is that compliance with the specification should be ensured.

Further details of the report can be found at www.edinburgh.gov.uk

² www.edinburgh.gov.uk/info/20074/schools/1423/independent_inquiry_into_ppp1_schools



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