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# Design versus performance specifications in construction projects

In international construction projects, the distinction between design (or prescriptive) and performance specifications plays a pivotal role in shaping contractual obligations and risk allocation. Understanding the impact of the choice of specification, shaping the content of the contract to align with that choice, and managing issues as they arise during the project are all important aspects of managing overall project success.

## What are design and performance specifications?

When design specifications are used, the employer provides detailed design

documents describing how the project should be executed, including specific materials, methods and equipment: for example, specifying particular grades of steel or providing specific designs. The key aspects of risk allocation in this scenario tend to include:

- **Employer's responsibility:** the employer is responsible for any defects in the design. If the employer's design is flawed, the contractor is not liable for issues arising from these defects, provided the contractor has followed the design accurately, subject to any duty to warn if the contractor becomes aware of errors or defects in the information provided.
- **Contractor's liability:** the contractor's liability is limited to executing the work

**Evelien van Espen**

*Crowell, Brussels*

**Gabriel Ganot**

*Exponent, San Francisco, California*

**Michele Ius**

*Danieli & C, Buttrio*

**Shona Frame**

*CMS, Glasgow*

in accordance with the provided design. The contractor may not be responsible for the performance of the final product beyond the specifications given by the employer. However, even when a design specification is provided, there may still be decisions the contractor must make when executing the work, which may ultimately affect the performance.

- **Design modifications:** any modifications to the design must be approved by the employer. The contractor cannot make changes without the employer's written consent, which can limit the contractor's flexibility in addressing unforeseen issues.

In contrast, performance specifications define the outcome to be achieved, such as performance levels, efficiency, or durability, leaving the details on how to achieve that outcome to the discretion of the party executing the work. The risk allocation in this scenario tends to be different:

- **Contractor's responsibility:** the contractor is responsible for ensuring that the final product meets the performance specifications. This includes selecting appropriate designs, materials and methods to achieve the desired performance outcomes.
- **Employer's liability:** the employer's liability is reduced, as the contractor assumes more responsibility for the design and execution. The employer is less involved in the detailed design process and focuses on defining the performance criteria.
- **Flexibility and innovation:** performance specifications allow the contractor greater flexibility to innovate and optimise the construction process. The contractor can choose the most efficient means to meet the performance criteria, potentially leading to cost savings and improved outcomes.

The nature of the contract tends to drive the type of specification.

In a design/build approach, the employer may contract with a single entity responsible for both design and construction, often setting forth performance-based criteria. The contractor assumes a higher level of risk, as it is responsible for both the design and the performance. This approach can encourage innovation and efficiency but requires the contractor to have sufficient technical expertise and resources to design and execute the project, such that it meets the performance criteria. It also requires the employer to clearly define the performance standards expected from the contractor.

This includes quality benchmarks, timelines and deliverables.

Conversely, in a design/bid/build approach, the employer hires a designer to create the project plans and a contractor to build it based on those plans. The risk profile can vary depending on the role the employer played in developing the plans, the relationship between the designer and contractor, and any subcontractors involved. This approach can be beneficial for projects where the employer has a clear vision and detailed requirements. The employer needs to ensure that design specifications are detailed and unambiguous, to avoid the need for variations and the potential for increased time and cost.

Of course, the above outline risk allocations are subject to specific contract terms and any alterations to the risk profile brought about by these.

In relation to standard of work, the contract will usually provide specificity. This will often include reference to complying with contractual documents, such as the employer's requirements, scope, specification, drawings or other documents where the work is described. Often, there may also be reference to compliance with building regulations, statutory requirements, standards and codes of practice, or other sector-specific standards or guidance.

In terms of liability, some contracts specifically include a fitness-for-purpose obligation on the contractor, such as the FIDIC Silver Book. Others imply a fitness-for-purpose obligation which can arise where there is, such as in a New Engineering Contract (NEC), an obligation to carry out work in accordance with the scope and the scope will define the extent of the contractor's design obligations and the purpose of the design work. Absent a contractual fitness-for-purpose obligation (in the UK at least), a contractor will have an obligation to execute the work in a good and workmanlike manner, using the skill and care to be expected of a builder of ordinary competence. However, under many national laws, where employers make known the purpose of the building or other infrastructure, and the circumstances indicate that they are relying on the contractor's skill to provide it, there is an implied term that the works will be fit for the purpose for which they were intended.

## Managing risk during contract negotiation

It is important for employers to consider what type of specification to provide, for contractors to evaluate the associated risk, and for both to negotiate terms that clearly delineate their responsibilities.

During the negotiation, a prudent starting point is to consider the development of the project through its time schedule, assessing the various phases, considering the scope of works and the possibility of variation, direction and the impact of these on the contractual provisions necessary to support the choice of specification. For instance, in a project aimed at the construction of an industrial plant:

- **Initial planning and design phase:** this phase involves the conceptualisation of the project, studies, preliminary designs and securing necessary permits. Important items to consider are the nature of the employer, the contractor's skills, the location and any mandatory legal provisions of said location (as it will affect approaches to responsibility), and details around flexibility and modifications. A government or public sector employer may focus more on strict compliance with regulatory requirements and a high level of accountability, whereas an experienced employer may have high expectations for innovative solution making, which can foster a more collaborative approach. A newcomer to the market may need guidance and support to understand responsibilities and focus on meeting fundamental requirements and standards. The ability of public sector employers to be flexible and accept changes may be limited due to bureaucratic procedures for approval, which can be time-consuming, whereas an experienced employer may show greater flexibility to accept adjustments based on evolving needs. Newcomers may lack flexibility for changes due to inexperience and prefer a clear and structured change process.
- **Detailed engineering and procurement phase:** during this stage, designs are developed and materials/equipment are procured. Questions may arise, which can include identifying responsibilities for various tasks, the extent of the scope and complexity of the project, and what is to be the approach to the specifications and performance standards. A more complex project will potentially require a more

detailed specification (whether design or performance) and risk management strategies.

- **Construction phase:** this phase encompasses civil works, installation of machinery, etc. Regular monitoring and quality control are essential to ensure adherence to the project specifications. In contracting terms, parties must consider key phases and milestones, requirements for progress reporting and performance monitoring, and any linkage to payments and retention.
- **Commissioning and testing phase:** upon completion of construction, the plant undergoes commissioning and then testing to ensure works meet the design/performance requirements. The type of specifications will also determine who is responsible for developing the commissioning and testing procedures.

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- **Operational phase:** once the plant is fully operational, ongoing maintenance and management are crucial to ensure effective functioning. This phase may also involve periodic reviews and upgrades to enhance performance. In the event of failures, this phase can be one where disputes arise related to performance against specifications.

Understanding the employer's goals – cost, quality, and/or time – will also influence the risk allocation and contract terms.

## Managing risk during contract execution

Issues can arise if there is ambiguity as to what type of specification is being referenced: these can lead to disputes and increased risk.

For instance, a specification that 'the structure should require no substantial repairs for 25 years' may seem like a performance specification but it may be difficult to confirm whether this standard has been met at the time of the construction.

Also, in a contract where the employer is responsible for design and engineering and the contractor for construction, the contractor might argue that it is following a prescriptive specification, constructing in compliance with the drawings provided

by the employer. However, certain aspects of the scope may actually be performance specifications. For example, if the contract states that the contractor must ‘fabricate and then deliver concrete caissons at location X,’ the employer might consider the obligation to deliver to be a performance specification. However, the contractor may argue that since the transportation of concrete caissons requires complex engineering, and since the employer was responsible for the overall design, the employer should have developed the method statements for transportation. The contractor may then require a variation to be issued, arguing that until the employer provides the required technical input, the ‘prescriptive specification’ is incomplete, rather than acknowledging that this part of its scope is under a performance specification.

In some cases, the nature of the specification can be unclear due to the content of lengthy technical schedules. For example, in the UK case of *MT Højgaard A/S v E.ON Climate & Renewables UK Robin Rigg East Limited and another* [2017] UKSC 59, MT Højgaard (MTH) was engaged by E.ON to design, fabricate and install the foundation structures for 60 offshore wind turbines. Shortly after completion, grouted connections incorporated within the foundation structures failed. MTH’s obligations included a requirement to exercise reasonable skill and care and to comply with an international standard for the design of offshore wind turbines known as J101 – a prescriptive requirement. However, a schedule to the contract contained a requirement that the design of the foundations ‘shall ensure a lifetime of 20 years in every aspect without planned replacement’ – a performance requirement.

Compliance with J101 was intended to bring about a service life of 20 years, subject to a probable rate of failure of between one in every 10,000 to 100,000 installations. However, J101 contained a significant error, not known about at the time the contract was entered into, which dramatically reduced the service life of the foundations. Compliance with J101 did not therefore provide a design life of 20 years in reality.

The Supreme Court commented on the issues arising, where complex contracts are entered into with obligations expressed in the main body of the contract but with other

obligations buried elsewhere in the technical schedules. However, it decided to give effect to the natural meaning of the two Technical Requirements Paragraphs, which introduced the performance element and imposed a fitness-for-purpose obligation, in addition to MTH’s other obligations to exercise reasonable skill and care and to follow the J101 prescriptive standard.

Disputes can also arise between the parties in relation to whether the parties ‘changed’ the nature of the specification. For example, where the contract has a performance specification, but the employer starts directing the contractor with extensive comments/direction during the project, can this change the nature of the specification from performance to prescriptive?

An important factor in answering this question will be the applicable law, and whether there are mandatory legal provisions that would take precedence over the contract.

To the extent there are no mandatory law provisions, the contract becomes the parties’ main reference point. There are certain clauses that provide guidance on the extent to which employer interference during the project can affect a performance specification.

For example, the contract may contain a ‘four-corner clause’, indicating that the contract can only be modified by a written (or even signed) amendment. Such a clause can protect employers who provided extensive direction on the methods chosen by the contractor to achieve a certain specification. These clauses exclude modifications of the contract by ‘behaviour’ so the employer can argue that the performance specification has been unamended to the extent oral comments or directions were given. There is one important caveat: if the employer’s comments or directions are given during meetings which are recorded in meeting minutes that are signed by the parties, the contractor might be able to successfully argue that the performance specification was amended to a prescriptive specification, by virtue of such signed meeting minutes.

Infrastructure contracts often also contain a list of ‘required submittals’ indicating, for each instance, whether the contractor or the employer is responsible for delivering the respective submittals. If the list requires the contractor to develop a method statement for achieving the performance specification, this is another indication that the contractor

remains responsible for the final method statement and achieving the performance specification, even if the employer has made its own suggestions of methods to be used.

Also, contracts usually state that approvals of drawings and other documents do not constitute acceptance or relieve the contractor from any of its contractual responsibilities. This can be an indication that any type of comments or approvals do not amend the contract.

Finally, contracts often contain clauses that require the contractor to confirm that it has reviewed the relevant documentation and remains liable for such project documentation (maybe with a few exceptions of rely-upon information). In this instance, even if the employer has sent the contractor preferred options of methods to be used or has given guidance on how to achieve certain specifications, the contractor remains liable to review this employer documentation for accuracy and compliance with the contract.

There are thus several contract provisions that can help manage the risk that performance specifications are requalified as prescriptive specifications, to the extent these clauses are permitted by the applicable law.

In the absence of such clear contract provisions or where the applicable law does not allow some of these clauses, parties need to resort to the applicable law to resolve their dispute concerning the specifications. Depending on the applicable law, this can lead to very different outcomes.

By way of illustration, New York courts consider numerous factors to analyse whether a specification is a performance specification or a design specification, such as: (1) the nature or degree of the contractor's involvement in the specification process; (2) the degree to which the contractor is allowed to exercise discretion in carrying out its performance; and (3) the parties' course of dealing. Accordingly, extensive meddling by the employer could have an impact and might lead a court to decide that the performance specification had become a design specification such that the contractor now only needs to show that it has complied with that to avoid liability.

By contrast, certain civil law countries have several important – even mandatory – provisions that determine the responsibilities of the parties when it comes to design.

Belgium has a three-party structure, where it is mandatory (subject to limited exceptions for particular industrial

installations) to have an architect<sup>1</sup> who is responsible for the final design, and where the architect and contractor, by law, cannot be the same party. The fact that the architect, and not the employer or the contractor, is responsible for the final design, immediately constrains the employer in its ability to include performance specifications to begin with.

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To the extent that meeting the performance specification requires real design activities on the part of the contractor, the parties would have been required by law to hire a separate architect. In addition, both the architect and the contractor have far-reaching duties to warn if the design will not be safe or fit for purpose, such that even if the employer tries to impose certain methods, the architect and the contractor will have final responsibility for warning the employer that a method might not be appropriate.

Regardless of the contractual provisions, the courts in Belgium therefore tend to be reluctant to place the design responsibility with the employer and the contractor's duty to warn is an additional important factor that is considered.

Whether behaviour during the project can alter the nature of the contractually agreed performance specification therefore depends on the contractual clauses and the applicable law.

In circumstances where a contractor has successfully argued that the employer altered the nature of the performance specification to a prescriptive specification through extensive direction, another question often arises: 'Can the contractor avoid liability by arguing that the method directed by the employer was doomed to fail?'

Again, the answer will depend heavily on the applicable law. Under New York law, this question is resolved using the Spearin Doctrine. To prevail under this doctrine, a contractor must show that:

1. its obligations were prescriptive design specifications;
2. it followed those prescriptive design specifications; and



3. the prescriptive design specifications were defective and could have never reached the desired result.

From a practical point of view, this is difficult to prove because it requires substantial factual and expert evidence.

The contractor will need to prove that it followed the exact method that was prescribed by the employer, and that it did not make any errors in the performance of its work.

The contractor will also need to bring expert evidence proving that the method or prescriptive design specification could have never reached the desired result. When the parties are working on a first-of-its-kind complex construction project, this can be particularly challenging. However, if the contractor succeeds in meeting its burden of proof, New York law does offer a way to escape liability.

By contrast, and as discussed above, certain civil law countries impose quite far-reaching duties to warn architects and contractors, such that even if a method was doomed to fail, the architect or contractor will still be liable, unless they specifically warned the employer about this risk and the employer insisted on the use of the method anyway (perhaps for cost reasons). To decide whether the architect or contractor should have warned the employer, the courts will assess whether a 'reasonable contractor of reasonable skill in the same situation' would have warned the employer. The threshold to escape liability in the case of 'defective specifications' could therefore be considered to be higher than under New York law.

### Use of technical experts

There can be several aspects where technical expert evidence is required in cases where compliance with specifications is concerned.

Where the 'doomed to fail' argument is deployed, this requires evidence related to whether the project specifications were aligned with performance expectations. From a performance-based argument, they may be straightforward ('the building did not withstand the specified loads') but in the context of a first-of-its-kind technology, that can be considerably more challenging. In this case, it is important to evaluate the foreseeable factors that were available at the time of specification designation, and

whether the designer applied techniques consistent with state of the art engineering/technical practice.

'Standard of care' arguments may also be used in conjunction with both types of specifications. It may be straightforward to identify whether the standard of care was met with respect to a design specification (eg, was the code followed?) although if the standard of care is a fitness-for-purpose one, arguments may arise as to whether the finished construction meets that requirement.

For performance specifications, it may be more difficult. In the case of complex and rare projects, it may be that no typical standard of care has been established due to the unique nature of the work. It can be further challenging to identify what impact the alleged design deficiency (whether in the specifications or in the execution of the design) had on the performance of the project. This is where the two types of specifications, and issues related to what standard of care is accepted (reasonable skill and care or fitness for purpose) are joined hand in hand.

As an example, consider a case where there is a performance specification for some component of a facility ('the component must carry a particular load'). Concurrently, there is an implicit design specification associated with that component (it had to be tested in accordance with a code). Further consider that, in this case, testing identified certain 'rejectable' indications in the component. However, the indications that were found, while rejectable, were benign and the component would satisfactorily meet the performance specification. This is an instance where the 'design specification' was not met, but the 'performance' remained unaffected. Depending on the code, the employer may be able to require that the contractor repair the identified indications. However, certain situations may also allow for additional engineering analysis, such as an ASME 579 Fitness for Service analysis, to determine what remedy, if any, is required.

Also challenging from the point of view of technical expert input is the situation where there is no clear performance deficiency. For example: 'the structure should require no substantial repairs for 25 years'. If the project is less than 25 years old, how does one

prove/disprove that this specification was met, unless it is clear there has been, or will be, a need for repairs considered to be substantial (however that may be quantified). In certain cases, one may be able to model the deterioration. In the case of corrosion or cracking, known corrosion or crack growth rates could, for example, be used to evaluate the potential for future degradation. Of course, such approaches require the use of accepted models and well-founded engineering assumptions.

### Practical and technical opportunities for dispute avoidance during the project execution

Large construction projects continually push the engineering envelope while attempting to limit cost overruns and delays. Given this, the types of issues identified above are not uncommon.

An emerging trend is providing opportunities during construction to clarify the technical, financial, and performance goals before there is significant impediment to the project. This requires parties to step away from the strict contractual approach and adopt a problem-solving, collaborative approach.

An example of this was a very large, structurally critical weld in a construction project executed in the United States. The performance specification detailed how the building, and this welded connection, had to behave during a large earthquake. The fabricator executed the weld in accordance with the welding code – effectively a design specification. However, the code never explicitly described a weld of this size and type. There was therefore a concern that the weld may not perform as intended. However, the contractor had executed the fabrication of the weld in accordance with the plans and the code. The project had already been built around this one connection, and re-welding it or re-building would incur significant time and cost expenses. The solution identified was that all parties collaborated to identify a plan involving testing of mock-up welds, identical to the one already in the building, to ensure that it would perform as required. This collaborative approach substantially reduced the delay and additional cost that might otherwise have been incurred.

### Conclusion

During contract negotiations, it is important for the parties to assess the nature of the specifications they are including into their contracts and the resultant risk allocation. Once a certain specification has been chosen, it is important to include contractual clauses that reinforce and confirm this choice, regardless of the parties' later behaviour.

It can particularly be helpful for parties to work with their experts during the negotiation phase, to make sure that the specification is feasible and clear from both a legal and technical perspective. Once the project execution has commenced, if issues arise, there is considerable benefit to parties working together to identify solutions to issues that emerge, notwithstanding strict contractual positions.

- 1 Under Belgian law, 'architect' is a protected title, and it refers exclusively to architects on the national list of architects. In this context, the architect is distinct from an engineer. The architect's task is to develop the design and perform the required calculations, etc. They are ultimately responsible for the design and need to sign off on it (even if engineers were also involved on the project assisting the architect).

**Evelien van Espen** is a counsel at Crowell in Brussels and can be contacted at [evanespen@crowell.com](mailto:evanespen@crowell.com).

**Gabriel Ganot** is Principal Engineer at Exponent in San Francisco and can be contacted at [ganot@exponent.com](mailto:ganot@exponent.com).

**Michele Ius** is Group Head of Contracts at Danieli & C in Buttrio and can be contacted at [m.ius@danieli.it](mailto:m.ius@danieli.it).

**Shona Frame** is a partner at CMS in Glasgow and can be contacted at [shona.frame@cms-cmno.com](mailto:shona.frame@cms-cmno.com).