

## Technical Note: FIDIC 2017 - making the Contractor's "design" obligations effective – Yellow Book clause 5.1

### Background

1. In the 1999 FIDIC suite – and for this note the Yellow Book is the example – there was very little scope or detail regarding the Contractor's *design* obligations. So it was with some anticipation that the FIDIC community looked forward to the 2017 revisions. Unfortunately, and with respect to the drafting committee, the 2017 revisions added very little, if anything, to the nature and scope of the Contractor's *design* obligations. Here are the changes marked up:

#### *5.1 General Design Obligations*

*The Contractor shall carry out, and be responsible for, the design of the Works. Design shall be prepared by designers who:*

- (a) are engineers or other professionals, qualified, experienced and competent in the disciplines of the design for which they are responsible;*
- (b) comply with the criteria (if any) stated in the Employer's Requirements; and*
- (c) are qualified and entitled under applicable Laws to design the Works.*

*Unless otherwise stated in the Employer's Requirements, the Contractor shall submit to the Engineer for consent the name, address, detailed particulars and relevant experience of each proposed designer/design Subcontractor.*

*The Contractor warrants that the Contractor, the Contractor's designers and design Subcontractors have the experience, capability and competence necessary for the design.*

2. You will see that the amendments are focused on the nature and qualifications of the *designers*, rather than the nature of the Contractor's design obligations. It is, with respect, very disappointing that in a contract that has "*design*" as one its key objectives these obligations were not expanded and expressed in more detail.
3. It is submitted that a significant limitation in the FIDIC 2017 suite is the failure to appreciate that the Contractor's design obligations are a discrete and (should be) a substantial part of his overall `scope of work. They need to be expressed in much greater detail for a number of reasons.

## Performance Contracting

4. First, the contractual components of performance-based contracting need to be understood. Performance contracts are a development of what are historically labelled “*design & construct*” contracts. D&C contracts are still used extensively and are a valid form of project delivery. What the “*performance*” factor adds is a hierarchal structure in the Employer’s Requirements, whereby the technical and engineering outcomes of a project are specified as the ultimate obligation(s) on the Contractor.
5. In what you might call *dynamic* projects (i.e. projects that involve transportation systems or complex facilities like airports), these performance criteria and objectives are set as the key objectives of the completed works. Examples of projects where a performance approach is commonly used are hospitals; airports; power stations; rail systems and plant such as processing plant and industrial complexes.
6. In these types of projects, the Employer would normally give to the bidders, and then the successful Contractor, some form of preliminary project layout and design. The Employer produces a preliminary project layout and design to be able to set the project in its desired landscape, or site or route alignment and to understand the range of land use and statutory approvals that might required.

Secondly, one critical issue in performance contracting is establishing the key technical and engineering dimensions of a project to enable bids to be obtained on a like-for-like basis. This factor is especially important in government procurement i.e., that bidders are bidding for the same scope of work, including the performance outputs for the project.

7. The performance criteria might include topics such as the reliability and availability of mechanical and power systems – both a sub-units and then as the completed system. These items can be expressed as the *mean time between failure* (MTBF) or for say rail transport systems the *mean distance* (travelled by the rail cars) between failures (MDBF). For complex projects like airports, these types of performance criteria are developed further and into mathematically based formulae that set targets of like 99% for plant and system *availability* and *reliability*. Items of plant that commonly attract these performance criteria are baggage handling systems and public transport systems like escalators, elevators and travelators. Similarly, for MEP systems such as fire suppression and standby power.
8. In these circumstances, the critical decisions which directly affect these outputs are made at and during the *design* phase. Complex mechanical and electrical systems are made up of component parts. The term *design* is used in the contract to include, relevantly, the specification and then selection of the mechanical and electrical

components that go to make up the installed system. In a Yellow Book-type design and build contract, it will be expected that the Contractor (via and in conjunction with his consultants) will have to *design*, in one way or another, all of the component parts so that the completed system(s) meets the applicable performance requirements.

9. Against this background, if the completed and installed system(s) does not perform as required, then one ground of complaint by the Employer will be that there were breaches by the Contractor in the *design phase* as well as that the final Works do not perform as contracted for. Hence, having detailed and prescriptive design requirements in the general conditions of contract is essential to give the Employer the contractual platform to support any claims against the Contractor when a performance-based contract goes wrong.
10. And let us keep these issues in context. If the Works perform and all goes well, then there will be no need to resort to claims by the Employer or even formal disputes. But here we are addressing the circumstances whereby the plant or equipment or system(s) does not meet the contracted outputs. In those situations, the Employer will be looking for as good a set of remedies as are available. It is a submission here that the terms of the 2017 FIDIC “design” obligations do not serve an Employer well, for the further reasons noted below.

**Is an enhanced definition of the design obligations needed in today’s market? Yes!**

11. It is, with respect to the FIDIC drafting committee, “market” in this day and age to set out in a performance contract detailed provisions relating to the Contractor’s scope of design responsibility. Such a sentiment is not “anti-contractor”. It is a recognition of the reality of modern project delivery contracts and the willingness of the contractor market to accept such requirements in a contract. Essentially, in the design portion of the Contractor’s scope of work, he accepts that he will be the designer; specifier and principle obligor of the performance targets for the project. The Contractor will carry Professional Indemnity insurance to support this role.
12. Commercially also, in these circumstances and in our scenario where something goes wrong, an Employer will always be looking to the Contractor for both the fix (in terms of defects warranty) and ultimately, if needed, financial compensation. The Employer will benefit greatly in this process if there are comprehensive design obligations supported by equally detailed technical performance criteria in the Employer’s Requirements.

## What is needed to properly scope the Contractor's design obligations?

13. What is needed firstly is a recognition that the Contractor's scope of work comprises two (2) key components:

- a. The *design services* to take any Employer's preliminary design and develop it into a final design for the construction of the Works. And here *design* means the full suite of classic design services plus the selection of all of the individual mechanical and electrical components to make the relevant system function to the levels and in the manner specified in the contract; plus
- b. The construction of the *physical Works*, as defined i.e., the Temporary Works and the Permanent Works.

14. Related contract issues associated with a scheme like this will be amendments to provisions that relate to errors in Employer Requirements (cl 1.9) and others.

15. Below is a scheme of provisions that comprehensively set out a Contractor's design obligations:

**"Design Documents"** means the drawings, specifications, manuals, documents and other information, samples, models, materials, patterns and the like required by the Contract and which have been created (and including, where the context so requires, those to be created) by or on behalf of the Employer or by the Contractor for the work under the Contract.

**"work under the Contract"** means all tasks and activities performed or required to be performed by the Contractor to carry out its obligations under the Contract including all Contractor's Design Obligations (as defined in Sub-Clause 5.1.2), the Works, Variations, Remedial Work, demolition work, all management functions, Site clearing and clean-up.

---

## 5 General Design Obligations

5.1 The Contractor shall carry out and complete the **Contractor's Design Obligations** and in doing so is fully responsible and bears all risk in ensuring that the design of the Works is to the highest level of quality and suitability and to international engineering standards so that the Works will be fit for purpose and use, will be durable and will have the serviceability and design life required by the Contract or otherwise by the world's best practices.

5.2 The "**Contractor's Design Obligations**" include the following:

- (a) ensure that all Design Documents satisfy the Employer's Requirements;
- (b) ensure that the Design Documents contain sufficient detail to construct the Works, so that the Works, when completed, will satisfy the Contractor's Warranties;
- (c) ensure that the details contained in any Design Documents are coordinated with the details contained in all other design documents produced by interfacing parties or subcontractors;

- (d) ensure that any necessary approval is obtained from the relevant Authority in relation to the Design Documents;
- (e) allow the Engineer, the Employer or any person nominated by the Employer, access to partially completed Design Documents at any time;
- (f) keep the Engineer informed of the progress of the Design Documents;
- (g) conduct sufficient investigations to ascertain the existence and extent of any Site Conditions which may have an effect on the Works;
- (h) design the Works so that the Works, when constructed, shall be structurally and aesthetically compliant;
- (i) ensure that appropriately skilled, experienced, qualified persons acceptable to the Engineer at all times supervise and co-ordinate:
  - (i) the design and specification of the Works and the preparation of the Design Documents; and
  - (ii) the construction of the Works in accordance with the Design Documents;
- (j) provide such additional information in relation to the Design Documents as the Engineer requires in a form required by the Engineer without any entitlement (and ensure that the appropriate personnel are available to attend meetings in order to provide that information); and
- (k) obtain a statement of no objection of the Engineer to the Design Documents in accordance with the procedures in the Contract, prior to commencing the Works encompassed by such particular Design Documents.

---

16. In these provisions, probably the first controversial issue will be the use of the term “*fit for purpose*” in cl 5.1 where it says: .....so that the Works will be fit for purpose and use.

It is a regular point of discussion with design consultants that their own PI market will not, thesedays, insure against a *fit for purpose* obligation. And to be fair that does seem to be the case – although not always. In the face of push back from the contractor, via his consultants on this term, the provision can be amended to something like: ...meets the requirements of the Employer’s Requirements.

17. However, it begs the question: *Is the Employer not entitled to have a project designed and constructed that is fit for purpose?*

From an Employer’s perspective, there will be a multitude of design and specification decisions that the Contractor will make (in conjunction with his design consultants) that the Employer will not be privy to or will not see in designs submitted to the Engineer.

It is not the role of the Engineer to undertake some form of design verification. The Employer relies on the Contractor to get it right and for the project to perform as contracted.

18. Below are notes to the additional provision above – again all for discussion.

Additional Provisions	Comments
<i>(a) ensure that all Design Documents satisfy the Employer's Requirements;</i>	The fundamental promise of the Contractor, repeated from above.
<i>(b) ensure that the Design Documents contain sufficient detail to construct the Works, so that the Works, when completed, will satisfy the Contractor's Warranties;</i>	<i>Constructability</i> of a design is a key concept that is <u>not</u> expressly addressed in the FIDIC forms and generally not addressed in standard form D&C or event Turnkey contracts. <i>Constructability</i> is both an engineering process (i.e., analysing construction methods to build a particular design) and a programming process. More can be found in resources like: <a href="https://www.construction-institute.org/constructability-resources">construction-institute.org/constructability-resources</a>
<i>(c) ensure that the details contained in any Design Documents are coordinated with the details contained in all other design documents produced by interfacing parties or subcontractors;</i>	Where the appointed contractor's, or major subcontractor's, works need to be designed and then constructed in the environment of an active site and then operate in conjunction with other plant and equipment or systems, it is important that the contractor undertake design integration with what are referred to here as <i>interfacing parties</i> . This information interface can be a critical management issue for an Employer/Engineer if it is not clearly spelled out as a contractor obligation.
<i>(d) ensure that any necessary approval is obtained from the relevant Authority in relation to the Design Documents;</i>	There should be no issue that it is the contractor's obligation to secure all authority approvals for its design. The scope of this obligation is not limited to items such as steel and concrete elements. Where it is a D&C form of contract and the contractor is designing fire and life safety systems, and related passages of egress, getting those designs approved by the Ministry of Interior or Fire Brigade can require detailed technical discussions, and be critical to timely project completion.
<i>(e) allow the Engineer, the Employer or any person nominated by the Employer, access to partially completed Design Documents at any time;</i>	It might seem a minor point, but almost all standard form contracts only require designs (in the broadest sense) to be presented to the Engineer when complete – even if it is a stage of completion. Better to be clear that, at any time, the Engineer can request progressive reviews of designs.
<i>(f) keep the Engineer informed of the progress of the Design Documents;</i>	As for (e)
<i>(g) conduct sufficient investigations to ascertain the existence and extent of any Site Conditions which may have an effect on the</i>	In the earlier Technical Note: <a href="https://lnkd.in/gBtPnRFT">https://lnkd.in/gBtPnRFT</a> there was a discussion of the need to have a broad definition of Site Conditions for design contracts and importantly for follow-on contractors and subcontractors. Essentially, the paragraph is intended to make clear that

<i>Works;</i>	the design (incl. plant and equipment selection and system design) must be grounded in the physical environment where it will be operating. For example, in the Middle East 2 features of the environment are the heat in the long summer months and the dust. These factors can well affect not just the performance of plant and equipment, but also say the ambient temperatures in the routes for evacuation in say underground tunnels and facilities.
<i>(h) design the Works so that the Works, when constructed, shall be structurally and aesthetically compliant;</i>	More focused on the architectural components of a D&C/ Turnkey type contract.
<i>(i) ensure that appropriately skilled, experienced, qualified persons acceptable to the Engineer at all times supervise and co-ordinate: a. the design and specification of the Works and the preparation of the Design Documents; and b. the construction of the Works in accordance with the Design Documents;</i>	Again, provision going to and expanding on the nature of the designers themselves. The role of qualified ‘engineers’ in the design process (as FIDIC 2017’s cl 5.1(a) stipulates, can be argumentative in some regions and for certain designs. The body of <i>designers</i> for any given project can include technical officers; architects; draftsmen and people not strictly qualified as an <i>engineer</i> or <i>other professional</i> , as those concepts are generally understood. Likewise, the implementation/construction phase of any design should be supported by similarly qualified and experienced people.
<i>(j) provide such additional information in relation to the Design Documents as the Engineer requires in a form required by the Engineer without any entitlement (and ensure that the appropriate personnel are available to attend meetings in order to provide that information);</i>	As development of (e) above.
<i>(k) obtain a statement of no objection of the Engineer to the Design Documents in accordance with the procedures in the Contract, prior to commencing the Works encompassed by such particular Design Documents.</i>	An adjunct to FIDIC 2017’s cl. 5.2.2 (Review by the Engineer), which seems, with respect, unduly long and complicated, stretching now over almost an entire page.

**Adj. Prof. Stephen Hibbert**

Dubai, U.A.E

February, 2022

[www.stephenahibbert.com](http://www.stephenahibbert.com)