

Principles for Appropriate Contracting

Foreseeing complexity and establishing a contractual environment to manage its consequences is the aim of this Guide. Commenting on an early diagram of one the figures developed herein, the Chief Scientific Adviser for the Department for Business Innovation and Skills, suggested that *“every procurement officer should have that on their wall”*

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Summary

Main learning points

This guide highlights the importance of

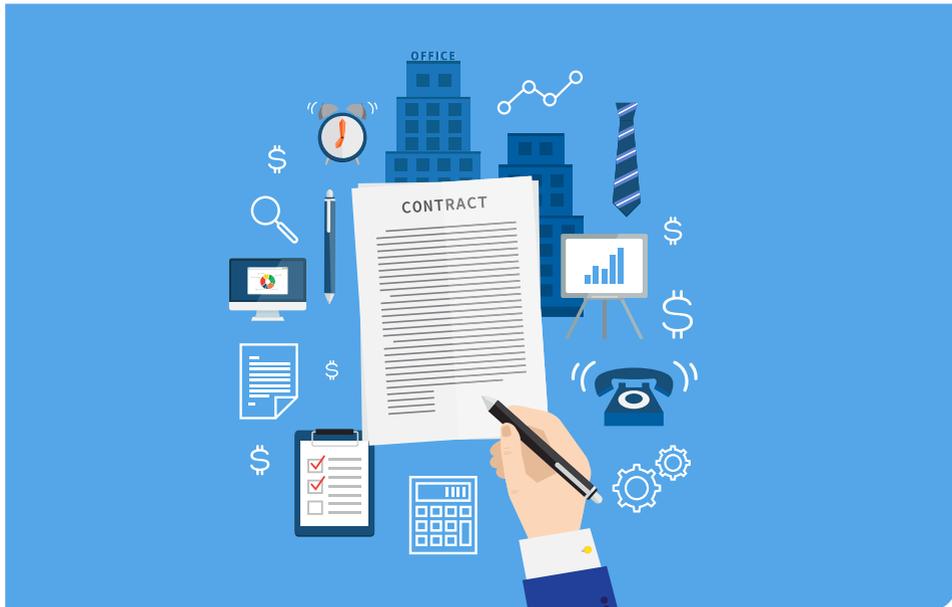
- Anchoring contract strategy in a set of principles
- Understanding readiness and engineering uncertainty early in the procurement cycle using a 'client penetration' point model
- Thinking strategically about alignment through an alignment framework
- Contract review and a structured learning approach through a Continuous Improvement system

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A modest guide to implementation

The following is recommended as a starting point for implementation:

- Bring together teams to consider how current practices are anchored in the principles, and where more could be done. This could also be used as enabler to integrate internal teams, such as technical, commercial, procurement and delivery teams
- Use the models as a basis for considering early engagement of relevant parties, including internal teams and relevant external parties
- Review the link between contract development and the Lean Continuous Improvement system, such as the lean projects tracker



1. Introduction

This guide was developed to support the use of appropriate and effective contracts. It is written in the spirit of continuous improvement, and also with the hope that it informs and inspires new ways of thinking. The contract is crucial, since it embodies procurement decisions and drives behaviour at different levels.

The Head of Construction for the Government Construction Team at the Cabinet Office recently noted at the 2015 NEC users' conference that *"a poor contract will inevitably lead to poorer outcomes"*.

Contractual problems still endure. Table 1 gives a summary of typical problems experienced with contracts, and some illustrative quotes from the collaborative research project that forms the basis for this guide.

While remedies have been proposed to counter such problems, there is still more work to be done. The principles and frameworks developed in this guide are in part a response to these problems, and encourage a way forward.

Lean thinking seeks to promote smooth and uninterrupted material and information flows. Contracts can make or break this vision. At worst they create 'contractual wedges' between processes and companies, resulting in disputes, at best they encourage and align all parties towards the right outcomes, putting in place the right conditions for delivery teams to do their work.

The content is based on research conducted through 2014-2015 as part of the Lean Research and Development Programme, initiated and funded by Highways England. It draws from an extensive range of interviews conducted with Highways England, clients, main contractors, subcontractors, consultants, legal organisations, as well contract bodies and user groups. It also included workshops to bring together different perspectives, and site visits for a number of projects.

Why read this easy guide? By the end of this guide, you should become familiar with a set of principles by which to consider good contracting practice, and some models to provoke thought into how to select an appropriate contract. It also encourages a more holistic approach to procurement and contracting.

Table 1: Problems with Contracts

PROBLEM CATEGORY	PROBLEMS MANIFESTED	QUOTES
Incentives and focus	<ul style="list-style-type: none"> - Misalignment of objectives, values and measures - Payment mechanisms create problems and wrong behaviours 	<p><i>“There is a real risk of perverse incentives, which lead to the wrong behaviours”</i></p> <p><i>“The balance of ‘best for project’ and ‘best for organisation’ is a tricky issue.”</i></p>
Risk allocation	<ul style="list-style-type: none"> - Wrong person/organisation owns risk - Lack of contingency allocation 	<p><i>“There can be a lack of clarity on the ownership of risk, and a lack of incentives to manage them”</i></p>
Governance	<ul style="list-style-type: none"> - Lack of clarity over roles, responsibilities and progress - Poorly defined protocols with ‘us and them’ culture 	<p><i>“Trust and transparency is key, but how do you encourage it, and ensure it endures?”</i></p> <p><i>“Leadership is important, since it significantly impacts on the behaviour of different parties”</i></p>
Scope	<ul style="list-style-type: none"> - Badly defined scope of work - Scope creep and change 	<p><i>“Late changes can be particularly damaging, leading to delays, disruptions and extra costs”</i></p>
Supply chain	<ul style="list-style-type: none"> - Supply chain engaged too late to influence - Interface risks due to incomplete or badly formed contracts. 	<p><i>“In terms of the way that requirements and risk cascade through ‘back to back’ contracts down the supply chain, do clients, contractors and subcontractors have a good understanding of this?”</i></p>

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HOW IS THE GUIDE STRUCTURED?

Section 2 gives an overview of a set of principles for appropriate contracting, which acts as the foundation for this guide. Sections 3, 4 and 5 comprise the main body, and each is explicitly linked with both the principles and Highways England initiatives. Section 6 offers a summary. For those that are motivated beyond this document, three further references are provided in each section.

2. Overview of the Principles for Appropriate Contracts

Figure 1 gives an overview of the principles proposed in this guide.

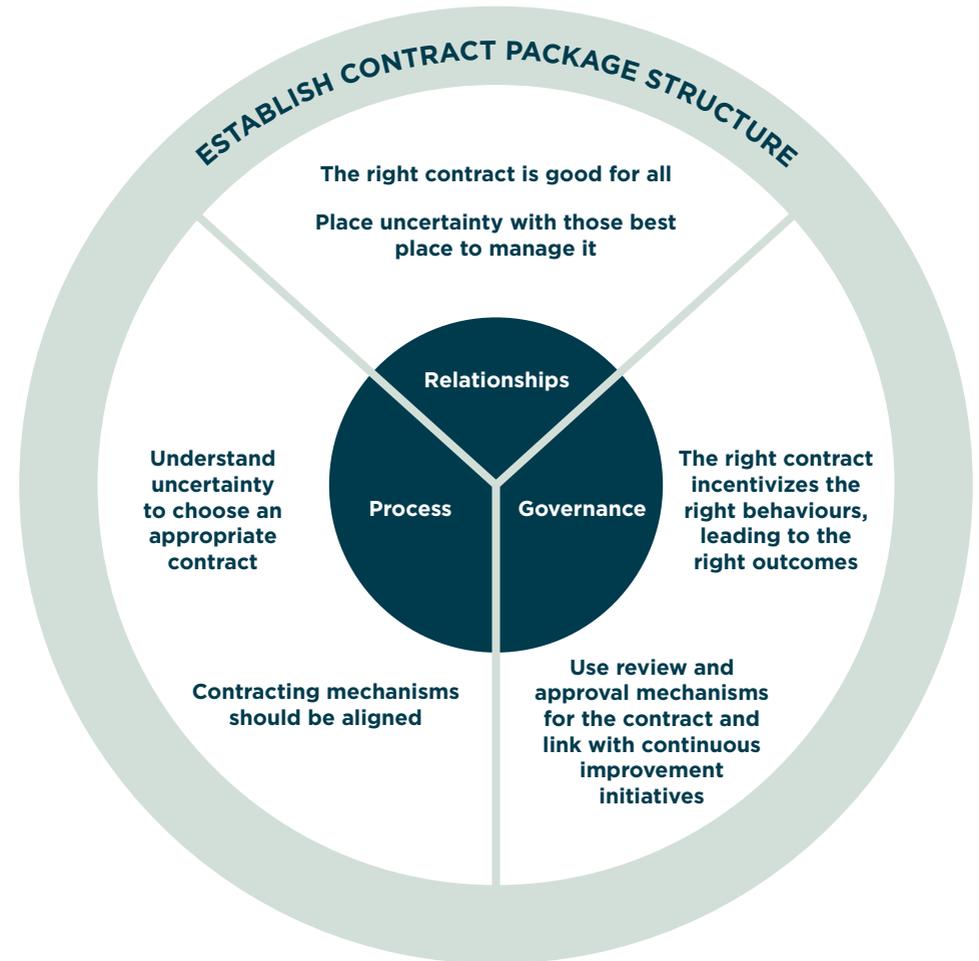


Figure 1: Overview of the Principles

CHOOSING A CONTRACT BREAKDOWN STRUCTURE

Works may be awarded as a large complete contract or broken down into smaller discrete packages. Multiple scope packaging has the advantage of flexibility so that different contract conditions can be used to suit the different work activities, but has the potential to create interfaces and fragmentation. Larger all inclusive packages have the potential to reduce interfacing issues, but the level of risk in bearing such a large contract must be carefully considered. The capability of a package owner to manage the interfaces may also be unknown.

The appropriate size and scope of the packages will depend on a number of factors, including client ability, capabilities of the supply chain, and project type. To support this choice the following is encouraged:

- Engagement with the supply chain to gather input into contracting strategy, as well as a structured approach to understand capabilities. Open dialogue and engagement with supply chain members is encouraged in order to evaluate their potential to support the contract strategy
- Encouragement of a broader collaborative climate to help soften any interfaces
- Put in place a structured process to control and manage interfaces, and structure internally so that interface problems can be managed

RELATIONSHIPS

Much has been written about partnering and alliance arrangements, which generally make the case that collaborative working across the supply chain maximises the likelihood of the right outcomes. Hence, we recommend that relationship management efforts are made and initiatives put in place to:

- Develop a collaborative climate
- Utilize Early Contractor Involvement

“ We need a collaborative climate for contracts ”

Client

The right contract is good for all

The contractual framework adopted plays an important part in encouraging collaborative behaviours. This raises the challenge of moving away from focusing on just one or two important contractual interfaces, but has a broader consideration of crucial systems throughout the supply chain. This includes:

- A move away from short sighted contracts to a broader consideration of the impact of contracts further along the supply chain
- Use of ‘back to back’ contracts with consistent terms and conditions, which balance a fair deal for contractors along the supply chain while also delivering value for the client

“ back to back contracts and consistent terms and conditions are normally better for all ”

Client

“ the back to back philosophy is right ”

Subcontractor

Place uncertainty with those best placed to manage it

Uncertainty must be managed in a coherent way, or else it will more likely than not result in negative outcomes than in positive outcomes. Hence, managing and allocating uncertainty is a key part of procurement strategy.

- The organisation that is best able to influence uncertainty is best placed to manage it

PROCESS

This refers to the importance of putting in place the protocols and routines that will lead to the right contract being identified and implemented. To do this the following is advised:

- The development of standard routines that ensure effective linking of engineering, technical teams, procurement and delivery based teams in developing an appropriate contract

Understand uncertainty to choose an appropriate contract

Dealing with uncertainty is commonplace in complex construction projects, but the extent, type, and exposure to uncertainty experienced varies across different sectors of the construction industry. Identifying the general nature of the uncertainty at the inception of a project is important for putting appropriate mechanisms in place. Hence, the following is advised:

- Give due consideration of the basis on which procurement begins in terms of certainty of design, method and complexity

Contracting mechanisms should be aligned

We argue that a ‘one-size-fits all’ approach to contracting is problematic, since there is a need to match and align contracts for projects. What is appropriate in one context may not be appropriate in another.

- Deploy contracting mechanisms that best align the interests of the parties for the project type

GOVERNANCE

One of the principal roles of clients and large main contractors is to apply effective leadership and governance, linking with the 'intelligent customer' concept. Part of this includes:

- Providing clear leadership in requirements and incentives to guide the supply chain
- Ensuring governance frameworks are in place for the contract documentation

The right contract incentivizes the right behaviours, leading to the right outcomes

The way in which organisations behave is largely driven by perceptions of what is in their own interests. Hence, incentivization needs to be designed in a way that balances the interests of different parties, and helps to align them in a way that is best for success. Guidelines include:

- Incentivization mechanisms to support collaboration and align the interests of parties
- Incentivization schemes to match the requirements of a project
- A clear, unambiguous articulation of the incentivization strategy and approach at the outset, which is not amended without proper consultation.

Use review and approval mechanisms for the contract and link with continuous improvement initiatives

It is difficult to appreciate all the potential impacts of contract conditions, or the behaviours that will be incentivised by contractual mechanisms. This is particularly the case the further removed from the contract drafting one becomes. Therefore, it is suggested that

- 'What-if?' scenario reviews are conducted to help understand potential impact and "future proof" the contract
- Put in place a continuous improvement mechanism or review cell to capture lessons learnt for contracts. This is particularly important for long term contract structures and frameworks.

Link to Highways England Initiatives and Documents

Highways Agency Procurement Strategy (2009)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414416/Procurement_Strategy_2009-10.pdf

Collaborative Delivery Framework

Category Management

http://assets.highways.gov.uk/about-us/procurement-category-management/CM_Operational_Guidance_Note_Overview_V1_Jan_2012.pdf



Reading for Section 2

Broome, J. (2002). *Procurement routes for partnering: a practical guide*. Thomas Telford.

HM Treasury (2014) "Improving Infrastructure Delivery: Project Initiation Routemap (Procurement)". www.gov.uk/government/organisations/infrastructure-uk

Kershaw, S and Hutchison, D (2009) "Client Best Practice Guide", Institution of Civil Engineers, Thomas Telford Ltd: Plymouth

3. Procuring under Uncertainty

“ There is a need for the team to pick the right entry point...with due consideration of the involvement of procurement teams, consultants and contractors ”

Consultant

Principle addressed

- Understand uncertainty to choose an appropriate contract

Relates to Process

The presence of uncertainty creates a range of problems and challenges. It often leads decision makers to add safety buffers - either explicitly or implicitly. A fuller understanding of such uncertainties may also open up opportunities for innovation.

Figure 2 presents a model to help make sense of the underlying uncertainties in engineering works. It shows generic activities in engineering flows, and the extent of ‘client penetration’ for a particular project. The bars in the diagram help to give a sense of the conditions when procurement begins and the extent of readiness.

“ Readiness of design, planning constraint, business case development and other factors can combine to give unexpected results ”

Main contractor

Viewed in this way, it is possible to see that procurement begins from significantly different starting points in terms of the certainty of design, method and complexity. Understanding this helps to position a project.

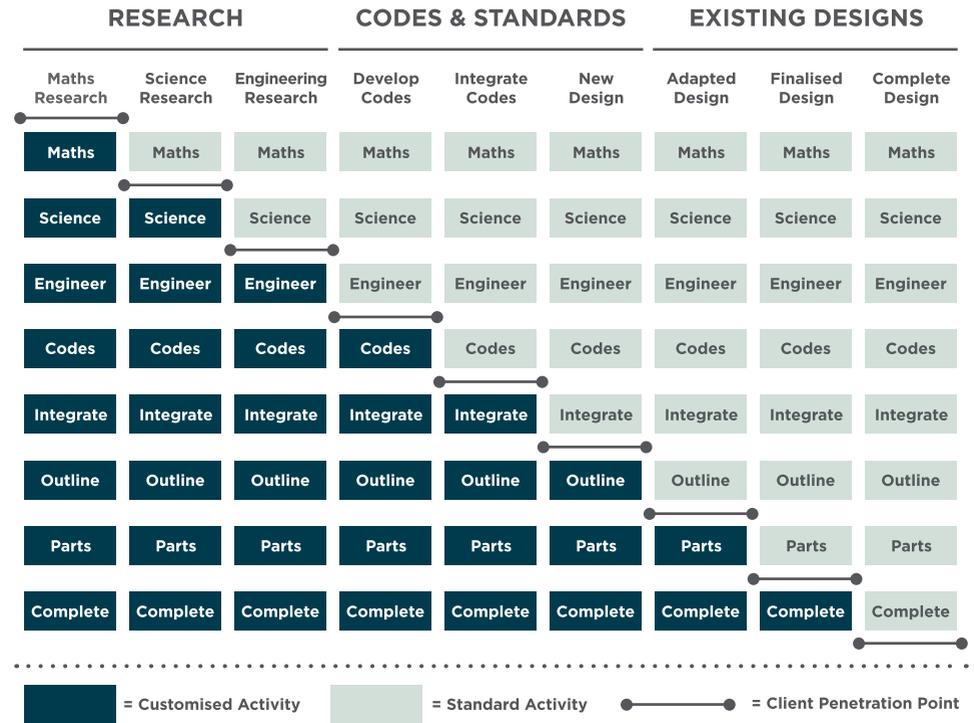


Figure 2: Range of Subclasses

Activities prior to the client penetration point are standardized, whereas shaded activities after the penetration point are customised for a specific project. In the latter scenario they are performed under uncertainty, since activities have to be adapted for an individual client or customer.

The figure indicates that engineering activities can be subdivided into three broad categories: research, code and standards, and existing designs. These, in turn, can be further refined to give nine engineering ‘subclasses’, which help to describe the state of readiness. Identifying this is important step that feeds forward into section 4 of this guide.

“ Procurement teams do not routinely take into account such complexity ”

Main Contractor

Case study examples are summarised below to give examples of the different subclasses. With the aim of promoting cross comparisons across industries, this section makes use of examples from outside of the Highways sector (section 4 makes use of Highways examples).

Research Subclasses

Procurement may begin from a starting point where Research and Development activities must be performed for a specific project. This may include proof of concept, testing, or even fundamental research to establish principles for a final solution.

The first subclass within this category is Mathematics Research where theoretical principles are unclear, and it is not even obvious that a solution exists at all. The second is Science Research, where theoretical foundations are likely to exist in principle, but the application is uncertain. A further subclass within this category is Engineering Research, where testing of materials, principles or applications is required.

CASE STUDY

In one site visited, a group of research and development companies were commissioned to undertake a manufacturing feasibility study to provide the mirror component for the Very Large Telescope in South America. The project makes use of experimental nano polishing processes and equipment so that the surface of each segment is polished to an extremely well defined profile. The procurement process had to bring together scientists and bespoke technology providers under uncertainty to attempt to prove that a solution is possible.

Codes and Standards Subclasses

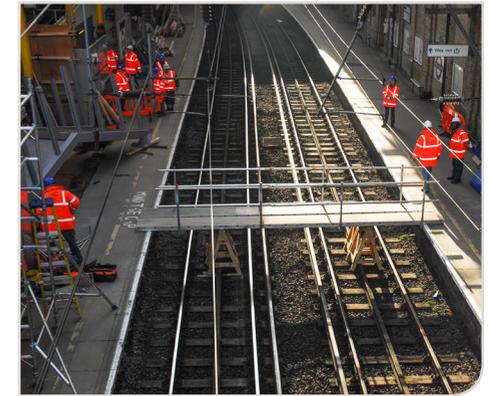
Alternatively, a project may begin through some interaction with an established set of codes, codified knowledge or standards. In this set of subclasses, the purpose of the project can be defined, but there is an open brief as to the solution.

The term codes is used to signify the use of an established body of engineering knowledge, which is recognised and drawn up into a readily available set of codes (e.g. Eurocodes) for a given community to use.

Develop codes is the first subclass in this category, where codes would have to be developed in order to articulate any new standards. Adaptation work may have to be undertaken to take test results and integrate for a specific, integrated solution. In the second subclass, new codes would have to be integrated with existing codes for more general market acceptance. Such acceptance may take the form of standards (e.g. British standards or Highways England Standards). Finally, new and unique designs may be developed using codes and standards as the starting point.

CASE STUDY

Both Farringdon and London Bridge Stations were visited during the project. For each, significant engineering works are being carried out due to broader Network Rail and Crossrail developments. In both cases, innovative engineering solutions were required while working with, and updating, existing Victorian infrastructure. Working with existing fabric, and the uncertainty of underground works, these projects can challenge practices and standards, calling for innovative solutions.



Existing Design Subclasses

The principal challenge here is to bring existing designs and knowledge together for the needs of a particular project. For example, the form, layout and integration will need to be considered on an order by order basis.

The first subclass in this category is adapted design. In this situation, individual parts of the design may be customised on a project by project basis, but the overall design rules have been established.

Finalise design is the next subclass in the classification, where existing components for a particular solution are assembled. The final subclass is complete design, where existing designs are perfectly suited to requirements.

“ Procurement issues need to be addressed early
in the project cycle in order to have an impact ”

Client

CASE STUDY

Another company visited as part of the study is involved in the manufacture of wind turbine towers. The manufacturer involved made substantial speculative investment in technology, capacity and the accumulation of ‘know how’ in order to enter the market. The latter involved inviting worldwide specialist and consultants to analyse the production facilitates and educate workers the company. Designs are standard, meeting international guidelines and quality accreditation criteria, but are manufactured to order with no speculative stockholding.

The case studies provide illustrative examples of different penetration points, and the challenges and opportunities found at different subclasses within the model. Viewed in this way, client organisations may wish to actively move or shift to different positions within the model. Locating the strategic penetration point in the model feeds-forward into section 4, where the benefits of aligning contracts according to subclasses are discussed more fully.

Link to Highways England Initiatives and Documents

- Projects should be categorized according to subclass types and considered vis-à-vis the current procurement strategy.
- Use the model to consider Early Contractor Involvement, linkages between design and engineering consultants, as well as internal linkages between technical teams, procurement, commercial and delivery teams.

Standards for the Highways

<http://www.standardsforhighways.co.uk/dmrb/index.htm>

Reading for Section 3

Gosling, J., & Naim, M. M. (2009). Engineer-to-order supply chain management: A literature review and research agenda. *International Journal of Production Economics*, 122(2), 741-754.

Olhager, J. (2003). Strategic positioning of the order penetration point. *International Journal of Production Economics*, 85(3), 319-329.

Wikner, J., & Rudberg, M. (2005). Integrating production and engineering perspectives on the customer order decoupling point. *International Journal of Operations & Production Management*, 25(7), 623-641.



4. A Guide to Appropriate Contracts

“Foreseeing complexity and setting a contractual environment to manage its consequences is key”

Main Contractor

Principles addressed

- The right contract incentivizes the right behaviours, leading to the right outcomes.
- Place uncertainty with those best placed to manage it.
- Contracting mechanisms should be aligned.

Relates to Process, Relationships and Governance

Clients have a choice in selecting appropriate contractual methods for a project (or set of projects). In this guide, it is argued that there is no ‘one-size fits all’ approach to contracting. Some are more appropriate for some projects than others.

There are many potential variables to consider, but a useful starting point is the nature of the uncertainty and state of readiness at the point of procurement discussed in the previous section. As will be explained in this section, basic contract payment mechanisms may be matched with the uncertainty subclasses.

Under the New Engineering Contract (NEC) suite, a number of main options exist, which give a basic allocation of financial risk. For brevity, three broad categories in the main options can be summarised as follows:

- **Priced or Fixed Priced Lump Sum (FPLS).** This refers to main options A and B in the NEC contract form. This method offers stipulated work in exchange for a fixed sum of money. Any variations are managed through ‘compensation events’ for which there is a structured process. The risks of carrying out the work are largely borne by the contractor.
- **Target cost/risk sharing.** This refers to main options C and D in the NEC contract form. The approach requires a move towards more transparent and open book cost calculations in the development of a target cost. Out-turn financial risks are shared between the client and the contractor in an agreed proportion, and incentivization systems are typically put in place to include ‘pain-gain’ agreements and KPIs. There is a sharing of uncertainty and risks in this mechanism, but significant resources are required to manage contract administration.
- **Cost/time re-imbusement.** This refers to main option E. The contractor is reimbursed its costs plus a fee, either as a percentage or as a fixed fee. Financial risks are largely owned by the client, so resources and project management capabilities will be required for tracking project progress.

Figure 3 is proposed to bring together the nature of uncertainty at the point of procurement, either research, codes and standards or based on existing designs, as well as the contractual mechanisms outlined above. This helps to consider the appropriateness of the contract, and the conditions under which specific options should be selected.

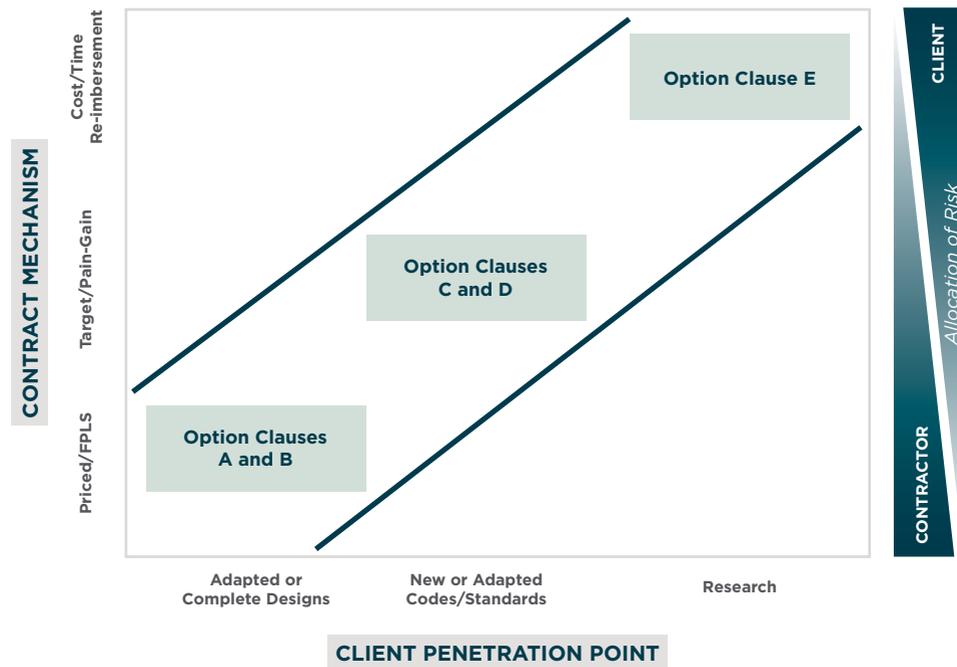


Figure 3: Framework to support contract selection

Risk allocation indicators are also shown graphically on the right of the diagram, highlighting that the client is more likely to be allocated financial risk for cost/time re-imbursement mechanisms, while the contractor bears more of the risk in priced contracts.

The figure highlights a suggested corridor of best fit, where the nature of complexity/uncertainty best fits the contractual mechanism. As a general guide:

- for adapted or complete designs a priced contract mechanism is suitable,
- for codes and standards a target cost is appropriate, and
- for research projects cost and time re-imbursement is suitable.

Moving to the top left of the diagram puts the client at risk of overpaying, and would require very robust project capabilities to track the project. Moving to the bottom right of the framework, the contractor may be put under too much pressure to bear uncertain outcomes.

Figure 4 shows the framework with illustrative examples, which are explained below.

Smart Motorways

At the time of writing, smart motorways schemes are underway in parts of the M25, M1, M62 and M3, where new technology is added to the road to increase the safety and reliability of journeys. Preceded by the Managed Motorways scheme, which were primarily priced contracts with limited incentivization, the Smart Motorways scheme is innovative and, at times, pushes boundaries in terms of design standards.

This is particularly the case when older existing infrastructure has to be raised to current standards. Under the newer smart motorways schemes, a target cost contract mechanism is used with a more balanced incentivization scheme through the Collaborative Delivery Framework, and standards are included as part of the contract data. Innovation is encouraged through value engineering clauses. Hence, such schemes sit within codes/standards, and use target cost mechanism.

Viaducts

This guide draws on three case studies, including the M5 Avonmouth Viaduct, M1 Tinsley Aqueduct and the M53 Bidston Moss Viaduct. All three projects involved significant updating, strengthening and structural work. Avonmouth used an ICE 5th Fixed Price Lump Sum contract, M1 Tinsley utilised an NEC target cost contract, and Bidston Moss employed NEC Option C with pain/gain share agreements, as well as Early Contractor Involvement initiatives. Hence, Avonmouth sits in the bottom-middle cell of the framework, whereas Tinsley and Bidston Moss sit within the middle cell.

Standard Bridges

An illustrative example visited was an arch system bridge incorporated into a bypass scheme in South Wales. The bridge was based on a BEBO arch system standard design, which articulates construction standards and procedures to follow, including fabrication, handling and transportation, construction and installation, backfilling and inspection. Minor adaptations were made due to the slope of the site and a preference for bevelled ends, but certainty in terms of design and method allowed for a priced contract form. Hence, it is positioned in the bottom left cell of figure 4.



Design reviews by Contractors

Examples of design reviews were encountered in both Smart Motorways and Viaduct schemes. Under such circumstances, a cost re-imbusement contract would be used for design reviews to assess the viability of proposals at an early point. Such 'de-risking' helps to ensure buildability, and identify problem areas at an early stage. This approach is positioned at the middle-top of figure 4.

Solution Development and Testing

Projects in the top-right cell in the framework will typically take the form of specific research and development projects to address a problem. One example is strength and resilience testing for an estuary crossing to cope with the tidal range. This was undertaken on a cost-reimbursement contractual basis.

Innovation and research projects

In the bottom-right cell in the figure, it is possible to see research projects positioned. The aforementioned mirror segments consortium was undertaken on this basis, using grants from government institutions. We also visited labs and spoke to the Leader of the 'Materials for Life' project at Cardiff University, which, in partnership with Costain, is developing the use of intelligent concrete through a fixed price lump sum research grant.

The framework has implications for the feasibility of contractual mechanisms. It is suggested that clients do not drift into the top-left cell unless there is a clear business need, and the client has resource and expertise in project management. The bottom-left cell should be avoided unless the risks to the contractor are understood, manageable, and allowances are made for uncertain outcomes.

By visualising contracts using the framework, contract strategy and structure can be developed in a more holistic way. A complete contract structure may also be mapped onto it, showing various levels and packages, as well as their linkages.

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“ It may be possible to migrate through the framework with maturity ”

Client

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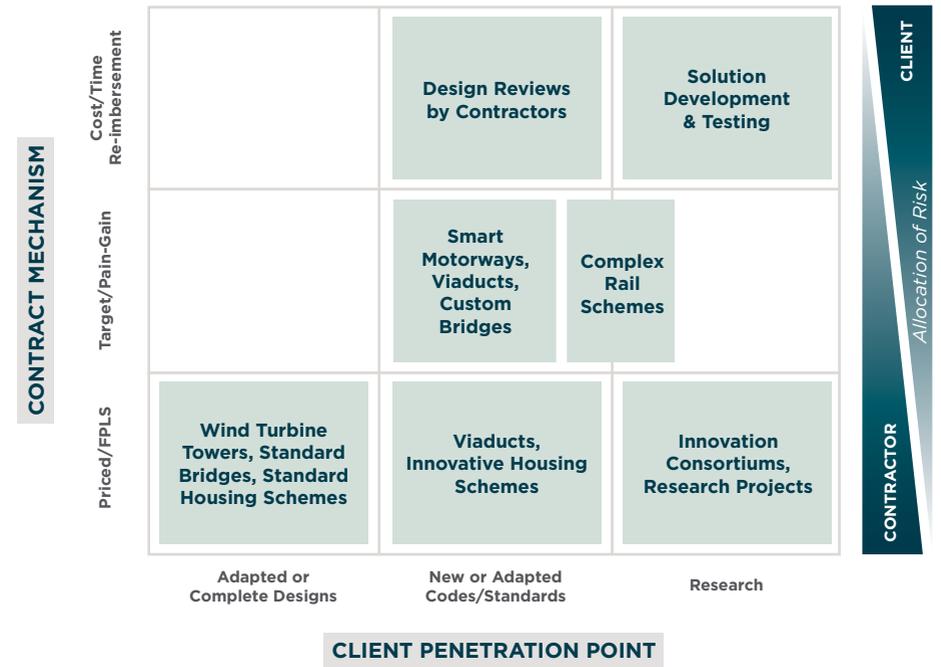


Figure 4: Framework with illustrative examples

Link to Highways England Initiatives and Documents

- Consider where and how such alignment takes place
- Visualise contract structure to give an overview of contract packages
- Document Links:

Strategic Alignment Review Tool (Start)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/409127/StART_Assessment_Guide_2013.pdf

Model Contracts:

<http://webarchive.nationalarchives.gov.uk/20140721115337/http://www.highways.gov.uk/about-us/procurement/supplier-selection-and-development/model-contract-documents/>

Reading for Section 4

Cox, A., & Thompson, I. (1997). 'Fit for purpose' contractual relations: determining a theoretical framework for construction projects. *European journal of purchasing & supply management*, 3(3), 127-135.

Gosling, J., & Hewlett, B. M. Naim. 2011. "A Framework For Categorising Engineer-to-Order Construction Projects." In *27th Annual ARCOM Conference, Bristol, September* (pp. 5-7).

NEC (2013) "NEC3 Procurement and Contract Strategies Guide", Institution of Civil Engineers, Thomas Telford: Glasgow.



5. Reviewing, Approval and Continuous Improvement

“More effective reviews of contracts...is something I would like to see much more widely across the industry”

Client

Principles Addressed:

- The right contract is good for all
- Use review and approval mechanisms for the contract and link with continuous improvement initiatives

Relates to Relationships and Governance

Review mechanisms should be put in place to ensure the contract meets intentions. Such reviews may be done on a draft contract prior to release, or over the term of a contract once it becomes live. The latter is particularly important for longer term framework agreements.

“Many scoring systems are used, but nothing seems to score the effectiveness of a contract or contract framework”

Subcontractor

Reviews prior to release of contract should be used primarily for considering 'what if?' scenarios in order to highlight potential effects on parties along the supply chain. It is likely that there will be consequences for motivations, behaviours and actions that have not been properly considered.

This may be undertaken by an independent approving body or board, or even by asking the parties involved to further understand what their response would be through a users' workshop. A structured checklist may be developed and used, but it would likely focus on the areas described below.

- Typical areas for review include risk identification and allocation, potential impact of the incentivization schemes, KPIs, consistency of terminology, clarity of clauses and terms, and Z clauses.
- Typical modifications might be to re-allocate risk, redraft clauses, change payment mechanisms or fine tune the incentivisation schemes and KPIs, as well as integrating Z clauses into standard clauses.

Figure 5 depicts a system for the review of contracts. Drivers for a particular project, such as financial and time constraints, as well as market and owner drivers, such as capabilities of the supply chain and client, as well as political drivers, such as new policy releases will result in a procurement strategy.

This strategy will inform and be embodied in the contract. The figure then shows a feedback system, whereby a review is undertaken considering different risk scenarios. If there is evidence of misalignment or unintended negative consequences, this may lead to a re-evaluation of the procurement strategy and/or contract.

The middle area of the diagram suggests that there should be a clear link into a continuous improvement programme and a 'plan-do-check-act' cycle. If done effectively, lessons learnt will be updated, and will also contribute into procurement decisions for future projects.

The continuous improvement system should be informed by best practice, current knowledge and thinking, and should document lessons learnt in a structured way. This may be linked to a wider audit system to evaluate and benchmark the effectiveness of different contractual frameworks.

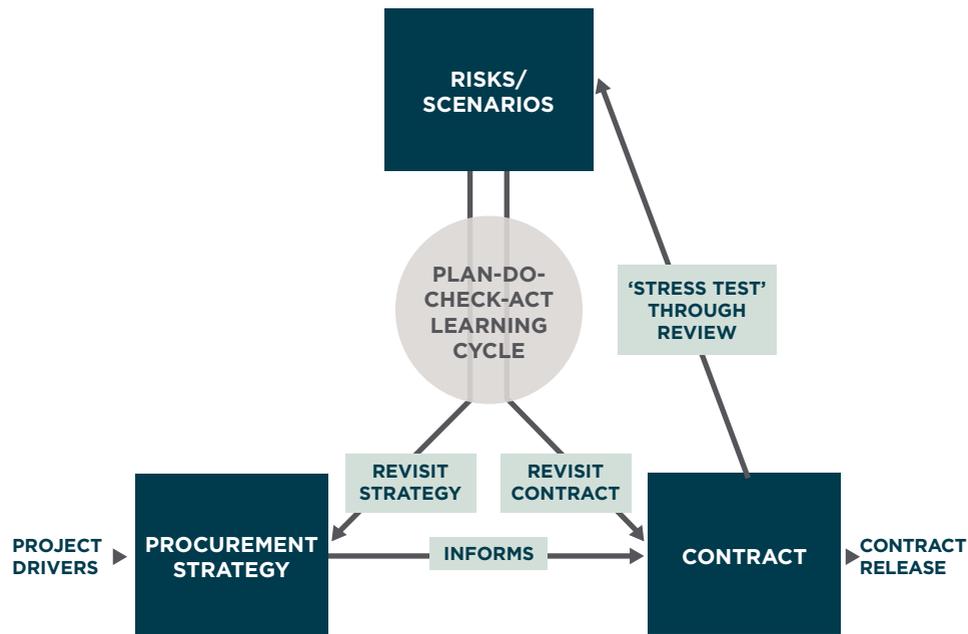


Figure 5: Review, Approval and Continuous Improvement System for Contracts

Link to Highways England Initiatives and Documents

- Consider where and how such reviews are undertaken
- Consider where and how feed-back and feed-forward of 'lessons learnt' takes place
- Document Links:

Project Control Framework

<http://assets.highways.gov.uk/our-road-network/managing-our-roads/project-control-framework/The%20project%20control%20framework%20handbook%20v2%20April%202013.pdf>

Investment Control Framework

Lean Project Tracker

<https://kol.withbc.com/HA-Lean/>

Reading for Section 5

Broome, J. (2002). *Procurement routes for partnering: a practical guide*. Thomas Telford.

Gordon, C. M. (1994). Choosing appropriate construction contracting method. *Journal of Construction Engineering and Management*, 120(1), 196-210.

Liker, J. K., & Franz, J. K. (2011). *The Toyota way to continuous improvement: linking strategy and operational excellence to achieve superior performance*. New York: McGraw-Hill.

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