

Standard Contract Provisions Roads

Volume 4

DESIGN AND CONSTRUCT CONTRACT MANUAL (D & C)

Second Edition: September 2011

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Standard Contract Provisions Roads

Volume 4 - Design & Construct Contract (D&C)

Second Edition, September 2011

PREFACE

Design and Construct Contracts (D&C) have been used by the Department in the past, with feedback and comment following use being assessed and incorporated into this Second Edition of Volume 4 of the Standard Contract Provisions Roads Manual. The Department's version of a D&C contract is not based on Australian Standard General Conditions of Contract for design and construct contracts.

This Volume 4 consists of a collection of Forms (templates) into which the project particulars can be inserted.

Unlike traditional delivery such as the RCC (Road Construction Contract), D&C Contracts require a "Brief" to detail the Scope of Works to be carried out by the Contractor. A "Generic Project Brief" has been included that has been developed for use on D&C, ECI (Early Contract Involvement) and Alliance contracts as part of move to adopt a common approach to define the Scope of Works and Technical Criteria (SWTC) covering road and bridge requirements where both design and construction are undertaken under one Contract. The 'Brief' is scalable for a particular project meaning that parts can be readily deleted if not applicable. Selection of tenderers is usually through a pre-registration process that may not follow the procedure set out in the MRPDS (Main Roads Project Delivery System) as used for the traditional contract delivery.

Ongoing feedback is encouraged and a Feedback Form is included for this purpose in addition to the Feedback email address in the copyright page. This is in keeping with the mandatory requirement for continual improvement. Please recognise that input is made useful and more likely to be accepted if you provide concise, comprehensive details of your proposals. The preferred method is to provide a photocopy of the relevant section of the form with the proposals marked up.

With the publication of this Volume of the manual, all D&C Contracts are to use the forms referred to by this manual.

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Volume 4

**DESIGN AND CONSTRUCT
CONTRACT MANUAL
(D&C)**

Second Edition: September 2011



Queensland Government

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IMPORTANT INFORMATION

The requirements of this document represent Technical Policy of the department and contain Technical Standards. Compliance with the department's Technical Standards is mandatory for all applications for the design, construction, maintenance and operation of road transport infrastructure in Queensland by or on behalf of the State of Queensland.

This document will be reviewed from time to time as the need arises and in response to improvement suggestions by users. Please send your comments and suggestions to the feedback email given below.

FEEDBACK

Your feedback is welcomed. Please send to mr.techdocs@tmr.qld.gov.au.

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Standard Contract Provisions Roads

Volume 4 Design & Construct (D&C)

Guide: Design & Construct Approach

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ACRONYMS

AC	Alliance Contract
Brief	The Generic Project Brief
D&C	Design and Construct
DBFO	Design Build Fund & Operate
DBOM	Design Build Operate & Maintain
DRB	Dispute Resolution Board
ECI	Early Contractor Involvement
EIS	Environmental Impact Statement
EOI	Expression of Interest
IV	Independent Verifier
MPO	Major Projects Office
TMR	Department of Transport and Main Roads
MPO	Major Projects Office
MRPDS	Main Roads Project Delivery System
OnQ	OnQ project management methodology
PI	Professional Indemnity
PUP	Public Utility Plant
PTU	Permission to Use
QTRIP	Queensland Transport and Roads Investment Program
RCC	Road Construction Contract
ROI	Registration of Interest
RPC	Roadworks Performance Contract
SCPR	Standard Contract Provisions Roads
SMS	Short Message Service
SWTC	Scope of Works and Technical Criteria
VMS	Variable Message Signs

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PART 1 PRELIMINARY

Standard Contract Provisions Roads Volume 4: Design and Construct Contract (D&C) has been prepared for the following purposes:

- for those who are interested in learning more about the design and construct delivery approach;
- as guidance for those who intend to use this delivery approach;
- to record the rationale behind amendments for future developments; and
- to document a typical D&C tender document

1.1 Using this Guide

This guide contains a number of forms and contract documents which have reference to several other internal and external documents (for example, Clause 42.9 Rise and Fall given in the General Conditions of Contract has an Index referred to in the catalogue of the Australian Bureau of Statistics) which can change from time to time. It is to be noted that any mistake in contract documents could result in adverse monetary and legal consequences. Therefore, the contents of all the documents in this guide should be thoroughly reviewed prior to use in a contract.

1.2 Contents of the Guide

MRPDS Volume 1 - Selection of Delivery Options discusses a range of delivery approaches and provides advice for the selection between options. The D&C contract is one of a suite of project delivery methods used by the Department of Transport & Main Roads (the Department) which include the Road Construction Contract, the Roadworks Performance Contract, the Minor Works Contract, the Alliance Contract and the Early Contractor Involvement Contract. Of these contract forms, the Alliance, ECI and the D&C are all forms of design and construct contracts.

As a number of contract types used by the Department employ a "Brief", there has been progress over the years to develop a "Generic Project Brief" suitable for D&C, Alliance and ECI. Major Infrastructure Projects (MIP) has developed such a Brief, built on experience of delivery from such projects as Tugun Bypass, Gateway Upgrade Project and others, with a D&C approach.

Edition 2 of the SCPR Volume 4 has adopted the use of the Generic Project Brief as an indicator of future progression along this path. The Generic Project Brief contains what was previously located in the Supplementary Conditions of Contract.

The following sections overview the circumstances where, unlike the traditional approaches such as the RCC where the Principal procures and owns the design, it is preferable that the Contractor procures and owns the design. The main characteristics of a D&C contract are discussed, including:

- selecting the D&C approach as that most appropriate;
- advantages and disadvantages of the D&C approach;
- the role of the Principal's Representative;
- risk allocation;
- the role of Independent Verifier (if engaged);
- tender document preparation;
- important aspects of the tendering process;
- the Stage Verification and the Permission to Use process; and
- contract administration.

Forms used in D&C contracts are provided along with other guidance material and advice on their use, including:

- Registration of Interest;
- Invitation to Tender;
- Key contract documents such as the General Conditions of Contract;
- Generic Project Brief;
- Other contract documents;
- Appendices of the various forms; and
- Tender evaluation.

Most of the forms provided cannot be altered or amended as they represent the Principal's corporate risk allocation or reflect legislative or contract law requirements.

Where forms provide for project specific information to be inserted, "blank" boxes are provided for that purpose. However, there are a number of project specific documents which need to be adjusted to suit the project specific characteristics more thoroughly, such as the SWTC and the Brief.

For further advice on the use of the Generic Project Brief refer to the Director (Contracts & Standards) of Engineering & Technology, or the Director (Project Management Services) of Major Infrastructure Projects.

It is anticipated that as the use of the Generic Project Brief is further embedded, such documents will require further amendments and an update of this SCPR Volume 4: D&C will be made reflecting such use. In the meantime, specialist advice in the use of these documents is encouraged.

Note: Past editions of SCPR Volume 4 D&C used the term "Offer" rather than "Tender" as do some of the generic forms. Where "Offer" may be found in various forms, it should be taken to mean "Tender". In addition, as the SCOC have been incorporated into the Brief where a reference to the SCOC may occur in unaltered forms, this is taken to mean the corresponding relevant reference in the Brief. Also some of the forms have not been altered from previous editions as they involve only organisational name changes (i.e. the Registration Brochure). Such amendments can be undertaken when a project is being delivered using the D&C approach.

1.3 Other related documents

Volume 1 of the Main Roads Project Delivery System (MRPDS) Manual provides extensive information on selecting a delivery model for road delivery contracts. D&C is one of the models discussed in detail. The discussion also includes the relevance of D&C approach to other contract systems such as Early Contractor Involvement (ECI) contracts.

At the time of this release, the Department is preparing a document on D&C contracts similar to the Contract Administration System (CAS) Manual which will be housed within the suite of contract administration system documentation. This will cover practical details of D&C contract operations. It is expected that this document will be released in January 2012.

PART 2 INTRODUCTION

This part provides an introduction to the D&C contract and discusses the key considerations to be made before employing this form of delivery. It also discusses some differences of this approach as compared to other contract types, such as the RCC, and highlights some of the more important aspects.

2.1 The D&C approach

In a D&C contract, the Principal contracts with a single entity, the Contractor, that undertakes both design and construction for a lump sum. The Contractor either employs a Designer in-house, should it have that capacity, or the Contractor engages external consultants.

The D&C incorporates management tools to facilitate the ability of the Principal to provide input into the design (should it wish to do so), to promote equitable asset delivery and to encourage the development of good working relationships through Client Leadership (Refer to MRPDS Vol 1).

There is also provision for the Contractor to adopt a design previously completed (or substantially completed) by the Principal. This design has to be novated to the contractor and the novation has the potential to present a different risk profile to the various parties to that of a Contractor's design. However, this risk is addressed by a requirement for the Contractor to take on the "novated" design as its own. This allows the Contractor to make modifications to the design before accepting the risks involved.

During the design process, the Contractor has the opportunity to introduce innovation in both design and construction processes, while still fulfilling its obligations and responsibilities under the contract. The ability for the Contractor to have input into the design based on constructability issues, equipment availability and construction processes can lead to significant benefits for the contract and Principal alike.

2.2 Key D&C issues

2.2.1 Design and Construction responsibility

The key feature of a D&C, is that it is the responsibility and obligation of the Contractor to both design and construct the works. This obligation is not, however, without constraints. The constraints are detailed in the Brief, which documents the minimum design and construction standards to be achieved by the Contractor. In addition there is the Permission to Use (PTU) process by which the Contractor must submit drawings and specifications to the Principal's Representative for a response.

Notwithstanding any response by the Principal's Representative, the Contractor is bound by the terms of the contract thus protecting the key principle of the D&C approach: The Contractor is responsible for achievement of both design and construction compliance with the Brief. It is clearly stated in the General Conditions of Contract (Clause 4.1) that the Principal is relying upon the advice, skill and judgement of the Contractor in the design and construction of the Works.

The main objective of the documentation of the Contract (whichever form is adopted) is to produce documents that are unambiguous and fair to both parties.

2.2.2 Single Point of Responsibility

There are a number of potential situations in traditional style contracts (design then construct as in the RCC) where the interface between the Designer, and the constructor of the works can become fertile grounds for disputes and claims.

There is potential for dispute as to responsibility where the works as constructed fail to perform in accordance with the specifications. In such instances, the Contractor might assert that the problems are a design flaw, whereas the Designer might assert that the design was adequate but the works as

constructed did not comply with that design. In D&C contracts, where the Contractor has responsibility for both the design and the construction, this interface risk is removed, provided the Principal does not engage in providing advice on design issues.

2.2.3 Design

As the Principal has significantly less control over the design than it would under traditional delivery approaches, the Principal must ensure that its requirements are adequately and clearly reflected in the Brief. This is not an easy task, requiring significantly greater effort to obtain the benefits of D&C than in developing a design only Brief, simply due to the Principal not controlling the design development process in a D&C as closely as it does for a design only.

Should the Brief not be adequately developed, there is a real risk of re-transferring the design risk from the Contractor back to the Principal by the Principal (or its representative) inadvertently instructing during design development. In addition, as the design is required to be submitted in packages, the Principal may also not be able to fully appreciate certain design implications or ramifications on other related packages. The General Conditions of Contract require that packaged submissions be provided with Designers' certificates to overcome the risk of this occurrence. Nevertheless, the risk of implications to other aspects of the design is still present when there is a lack of co-ordination of the design development process by the Contractor.

There is also a risk that the Contractor may try to effect savings and increase margins in the lump sum contract by under-designing aspects of the works. While reducing the initial cost, under-designing may have expensive longer term implications (design minimisation or cost minimisation). This may occur as a result of the Brief inadequately defining performance or quality requirements or due to inadequately prepared or undertaken surveillance and contract administration by the Principal.

Larger or more complex contracts may have multiple design packages containing submissions from different design disciplines such as civil design, structures, electrical & lighting, ITS, landscape & urban design.

Problems can arise when the Contractor's design is different to the Principal's reference design. In such a case, the contract may be written to reflect the fact that the Contractor's offer (for those areas that differ to the Principal's reference design) should be treated as a variation for the convenience of the Contractor. Therefore the Contractor will have no recourse on the Principal for issues/ claims that occur as a result of the Contractor's offer.

More mature design prior to contract commencement could have a major positive impact during the construction phase. During the design, good communication is essential between the contractor's designers and the Principal's team and the reviewers.

It is important that the design should be done or overseen by those who understand the Department's design and construction practices. Contractor's who employ foreign designers have caused considerable problems in some past D&C contracts due to their interpretation of local legislation, standards, codes and practices.

It is important to adopt a stage verification process for the design review to monitor the design process. Without such a process, the Principal may not have a clear idea of the end product. Work may be carried out without completed designs which may result in rework. Stage design verification process includes reviewing the design at various stages such as 15%, 50% and 85% stages of design development. The 15% design is normally the Tender Design which would be reviewed during the tender assessment stage. The Contract needs to specify particular requirements for the design submission and the review process. When the review process is satisfactorily completed (i.e. 85% completed), the design is deemed suitable and the Permission to Use (PTU) may be granted.

Innovative or unique designs may lead to maintenance problems in future years unless such details are considered by the Principal during the tender phase and during design development. The PTU process facilitates the Principal's consideration of this aspect.

2.2.4 Constructability

The D&C approach makes it possible for the Contractor and the Designer to work in a more collaborative way in the earlier stages of a project, as compared to traditional contracts. This allows the Contractor to bring construction expertise and efficiencies into the design process. The ability of the Contractor to design the works with the requirements of construction in mind has the potential for significant cost savings for the Principal.

2.2.5 Fast Tracking

There are opportunities for "fast tracking" in D&C contracts where sequential activities under traditional approaches can be undertaken concurrently. The pre-tender phase is likely to be much shorter than for a traditional contract because it is only necessary to prepare the Brief and the concept design rather than a fully detailed design prior to inviting tenders. In addition, some early preparatory works are able to commence prior to design and the detailed design work is able to be performed in a staged manner during the early stages of construction. Furthermore, the Contractor is able to develop the design sufficiently to advance construction activities (in accordance with the program) rather than waiting for the complete design to be available.

In practice, however, the Principal's approval processes can mitigate the achievement of such "fast tracking" with a temptation to require the Contractor to develop a very advanced tender design so the Principal can better understand what is being purchased before making any award. It is not unheard of to find that for some D&C projects, the design is almost 90% complete at award.

This is a risky approach by the Principal as the tender validity period usually only runs for a limited period of between 3 to 6 months. Tenders awarded late in the tender validity period invariably indicate that the assessment and approval processes of the Principal were not adequately prepared for the D&C approach.

The Principal should always assess its capability, capacity and preparedness to undertake the D&C approach to avoid such circumstances which can effectively eliminate any advantages the D&C approach may have over traditional delivery.

2.2.6 Potential for Innovation

There is a greater potential for innovation in D&C contracts as compared to traditional contract types, as the design and construction activities can be better integrated by the Contractor. Contractors (and their Designers) with different experiences may bring new ideas to the project concurrently. In a traditional contract, where the design is guided by the Principal's team, the opportunity for innovation is lessened as often the line of thinking may not change much from one project to another. Additionally the Principal's team may not envisage as clearly the potential construction processes. The flexibility allowed in aligning the design with constructability aspects creates an enhanced opportunity for innovation.

2.2.7 Resources

D&C's are resource intensive for both the Principal (particularly in assessing the design for suitability) and private industry (several Designers and constructors preparing tender designs). Therefore, resource requirements should be carefully considered during the assessment of whether a D&C is the most appropriate delivery method when the industry has limited resources available.

2.2.8 Tender Process

The tender period can be intensive, particularly due to the time and effort required to assess design proposals from multiple Tenderers. The tender stage can be extensive, up to 12 months for some complex projects, from advertising the tender to actual award (after allowing for a suitable tender period, a detailed tender evaluation period and approvals). Furthermore, the Principal will also be required to undertake sufficient preliminary design during the Business Case for land acquisition processes to secure the land corridor before the tender is advertised.

This is a significant departure from the traditional delivery method where land can be secured while the detailed design is underway and before the construction contract is advertised. For D&C, land acquisition is undertaken on the basis of the concept design developed for the Business Case by the Principal.

It can be difficult for the Principal to comparatively assess tender proposals where the tender designs differ significantly. It is not uncommon to find that the most attractive solution may be a combination of proposals from competing Tenderers.

The Principal's ability to take advantage of such a situation can only be made possible if provisions have been made in the tender documents to allow for use or purchase of intellectual property contained in each tender. An offer contribution amount is one such approach.

However, the successful Tenderer may not choose to adopt proposals other than its own and negotiations during the tender evaluation would be required should the Principal choose to adopt this path. These negotiations are likely to be intricate and commercially sensitive. In this event, the Probity Advisor would need to be intimately involved to ensure Tenderers were treated equally and fairly during such negotiations.

2.2.9 Key Tasks

The following are the key tasks of the Principal (and its representatives) associated with D&C contracts:

1. Pre-work, scoping, planning and property resumptions, public utility plant ;
2. Tender document preparation including a preliminary design & the Brief;
3. Tender assessment, clarifications, and awarding the contract;
4. Contract management including an initial phase in assessing the design for suitability;
5. Maintenance management; and
6. Contract finalisation.

These key tasks and involved activities are discussed in more detail later.

2.3 Selection of D&C as the most appropriate delivery approach

The selection process for the most appropriate project delivery approach for the Department's projects is contained in MRPDS Volume 2.

The circumstances that generally favour D&C include the larger more complex projects, for example, where there:

- is potential for innovative design solutions;
- is potential to gain efficiencies through integration of the design and the Contractor's construction approach;
- is potential for few problems to arise outside the Contractor's control;
- are multiple design responsibilities and interfaces;
- is potential for savings in time and/or scope;
- is complexity in traffic staging where staging is design dependant; and
- are constructability efficiencies that are dependant on the design approach adopted.

Hence, the Contractor is best placed to manage/mitigate significant project risks.

2.4 Advantages and disadvantages

D&C has a number of advantages over some other delivery strategies. These include:

- A D&C contract makes it possible for the Contractor and the Designer to work in a collaborative manner potentially incorporating the best from both parties. This may result in a closer integration of design and construction (e.g. design is carried out in a manner that allows the construction to be optimised by drawing on the Contractor's construction experience and methodology);
- Cost and time may be reduced by the Contractor's capacity to achieve significant efficiencies through its control over the design consultants and its ability to undertake constructability studies and implement value management studies to optimise design and construction in combination;
- Relative certainty of price by having the Contractor prepare and take responsibility for its own quantities, rates and lump sums;
- There is a single line of responsibility for the design and construction stage, rendering it unnecessary to distinguish between defects in design and defects in construction, hand-over issues from design to construction, misinterpretation of design features or lack of consideration of construction aspects;
- In the case of design defects, the Principal is protected to a higher degree with a D&C approach. In a traditional construct only contract, a design professional hired by the Principal must merely exercise the degree of care expected of a competent professional. Whereas, the Contractor under a D&C contract is required to warrant that the design (and construction) is fit for the purpose expressed in the Brief;
- The Contractor has a higher degree of control over the project, and is better placed to predict, manage and absorb the risk of events such as latent conditions that are not excluded, adverse weather and industrial disputes, impacting negatively on the time and cost;
- The design will be implemented having regard to the most efficient method of construction in respect of both time and cost. This can minimise costs to the Principal, maximise the project component of the lump sum for the Contractor and generally comprise a goal common to both parties that may serve to reduce conflict; and
- This D&C approach has the potential for reduced claims and disputes because the Contractor manages the design and construction, thereby eliminating the traditional interface between the owner employed Designers and the Contractor. However, in order to achieve this advantage, the Brief has to be adequately prepared. Many other precautions that can be taken to achieve this advantage are given in this document.

2.5 Disadvantages inherent in the D&C method are as follows:

- D & C procurement is resource intensive to all parties. It is less attractive to the industry in times of high activity.
- While it remains important that the Principal monitors the design and quality of the work being executed, monitoring must be done in a way that does not result in design risk being transferred back to the Principal. If the Principal or contract administrator adopts an active and dominant role in finalising the design, as opposed to merely ensuring the design complies with the Brief, the advantage of shifting design responsibility to the Contractor may be lost. Along with careful drafting of the Brief, it is also essential to have careful drafting of administration and surveillance provisions for contract administrators concerning review of the design and work under the Contract;
- Lack of clarity in the design and construction specifications in the Brief will probably lead to disputes;
- As considerable investment can be associated with preparing D&C tenders, the Principal may consider offsetting tender preparation costs by making a financial contribution to Tenderers. The cost of this to the Principal may be substantial;

- It can be difficult for the Principal to comprehensively assess tender proposals submitted by prospective Contractors as proposals may differ significantly. In fact, the best solution may end up being a combination of the proposals and this can only be done if provisions have been made to allow the purchase of intellectual property contained in the bid from each Tenderer;
- There is a potential for the Contractor to effect savings and increase its returns within the lump sum contract by under-designing aspects of the project. This is possible when the design brief inadequately defines performance or quality requirements;
- The Principal effectively hands over the design to a third party without a clear brief and there is a tendency for erosion of standards and poor maintenance outcomes.
- For complex projects, conservative time frames are required for procurement and delivery to allow for unknowns.
- There is potential for design and price minimisation once a contract has been awarded; and
- From a practical viewpoint, the Principal has significantly less control than it would by other delivery methods where it undertakes the design, giving the potential under the D&C for transfer of design risk back to the owner should the Principal be seen to instruct the Contractor in to design aspects.

PART 3 DEALING WITH RISK

Appropriate risk allocation is an important part of contract development and future management. (Abrahamson's Principle: The element of risk identified should be carried by those who are best capable of controlling it).

The D&C approach aims to assign risk to the parties that are best placed to manage that risk. With the overarching premise that the Principal is relying on the Contractor for its expertise to design and construct the Works. The Contractor has an incentive to maximise constructability and to minimise and deal efficiently with the design and construction interface. The potential for innovation may be stifled should the Principal develop an overly prescriptive Brief rather than one that is output orientated. The latter approach creates more opportunities for innovation, as it is more flexible, however, that is not to say that the minimum requirements of the Principal should not be complied with.

The Principal can select what risks it is best able to manage or willing to take if it can undertake those more cost effectively than the Contractor. For example, certain approvals are best managed by the Principal than the Contractor, some PUP are best undertaken by the Principal before the contract is awarded or may be commenced by the Principal but completed by the Contractor, prior work by others, etc.

3.1 Risk

In dealing with risks in D&C contracts, not only are there the obvious physical risks associated with construction, but there are also those risks associated with the procurement, design, maintenance and ongoing operation activities. Some risks will be present for the duration of the project and require constant attention and management while others occur intermittently. It is for this reason that the Project Risk Register is established by the Principal during the Business Case and reviewed and updated regularly (usually as project milestones are reached). Risk analysis involves a critical assessment of each identified risk in isolation in order to determine its likelihood and consequence. This is then followed by an examination of related risks to determine any compounding effects and influences of individual risks acting in concert.

The treatment and allocation of design risk under a D&C delivery is the most significant departure from the traditional delivery method. By using a D&C delivery, the Principal is transferring the design risk to the Contractor, including the design risk associated with the design work undertaken by the Principal.

This means that from the Principal's perspective there is one single entity responsible for design and construction. This removes the often difficult task of distinguishing between and deciding responsibility for design and construction errors.

3.1.1 Contractor's Risk

In general, Contractor's risks should be limited to those classes of risk that can be best managed by the Contractor, including but not limited to:

- The Contractor being solely responsible for the design and construction of the Works;
- The Contractor warranting that the design is in accordance with the "Brief";
- The Contractor's design being "fit for its intended purpose" and being constructed in accordance with the standards specified by the Contract;
- The Designer warranting the design and warranting that the construction is carried out in accordance with the design;
- Works complying with the requirements of all Authorities;

- The Contractor's warranties being unaffected (in theory) by "actions by the Principal" (see under clause 4.3, General Conditions of Contract). However, the reality is actions by the Principal causing costs or delays to the Contractor will likely result in claims;
- The Contractor is responsible for making its own investigations as to site information and warrants to have done so. The Principal needs to exercise care in the provision of any site information. Sufficient time must be allowed for the Contractor to inspect, evaluate and make its own interpretation of site information;
- The Contractor arranges for any remaining Public Utility Plant (PUP) relocations with the Principal paying any of the Authorities' costs of doing so. The Contractor is responsible for liaising with the Authorities and co-ordinating the relocations in a manner that aligns its construction program with the PUP relocations. The Contractor is responsible for any delays due to lack of co-ordination;
- Wet weather and its effects can be incorporated by the Contractor into its program of works to better manage this risk. Commonly, a set allowance of wet weather delays (days) are allowed in the contract before the Contractor's entitlements are triggered. For the set allowance of wet days, the Contractor takes all the risk and for any extra days over this allowance, the Principal takes the time risk and the Contractor, its cost risks;
- The Contractor and Designer must take out Professional Indemnity Insurance, Worker's Compensation Insurance and Public Liability Insurance. Values should be as shown in the Annexure Part A, General Conditions of Contract (subject to PAI requirements); and
- As the D&C includes the ability to "novate" to the Contractor a previous design by the Principal, the Contractor may elect or be requested to take up the Principal's design as its own and furthermore, warrant that it is fit for its intended purpose. Due allowance for the appropriate investigations and verification checks by Tenderers needs to be factored into the tender period to enable this to effectively occur.

3.1.2 Principal's Risk

The Principal will accept risks that the Contractor cannot be reasonably expected to manage, such as:

- Where the proper execution of the work under the Contract is dependent upon, or appreciably affected, by the work carried out or that has been carried out by others - "the prior work";
- Delays by the Principal;
- Actions or non-actions or directions by the Principal, although excluded in the contract, may inadvertently occur and may be interpreted as Principal caused delays;
- Latent conditions, other than specifically excluded in Item 15 of the Annexure to the General Conditions of Contract;
- Third party delays/ influences;
- Variations by the Principal;
- Changes in the law that could not have reasonably been anticipated;
- Unexpected events beyond the control of the Contractor, such as riots, civil commotion etc; and
- Changes in scope by the Principal,
- Transport & Main Roads has implemented a Principal Arranged Insurance (PAI) scheme, which has two elements:
 - The first is the bulk policy, which covers contracts to a value of \$150M for works and liability;
 - The second is project specific insurance, which uses the bulk policy as a basis but also adds PI insurance.

Where the PAI program does not suit, project specific insurance requirements are negotiated on an as-required basis for projects over the limit or for projects with special requirements. The upper limits, premiums and deductibles for this type of cover are subject to negotiation, depending on the value and risk profile of the work to be undertaken.

Specialist advice must be obtained from the Infrastructure Risk Management and Insurance Unit (MIP) through the Director (Contracts & Standards) of Engineering & Technology.

In order to deal with potential risks arising during the contract, it is necessary to provide a sufficient allowance of funds in a 'risk pool'. This will give the department more price certainty. However, this pool should not be more than what is reasonably predicted as contractors may assume that this pool could be used for their advantage, thereby making more claims.

In considering Principal's risks, it is recommended to consider the following as well, which have been identified during past D&C contracts:

- There is a risk of awarding contracts to contractors who make unusually low bids. Having been awarded the contract, they might resort to claims to increase profits during the construction stage. Consider use of unusually low bid clauses.
- Tenderers not having sufficient time to undertake/ order any additional geotechnical testing can be a risk to the Principal. Sufficient time should be provided for contractors to obtain required geotechnical information.

PART 4 KEY FEATURES

This part provides a brief explanation of some of the key features associated with a D&C contract.

The following are the key features discussed:

- The Brief
- Principal's Representative
- Independent Verifier role (if adopted)
- Encouraging innovation
- Quality
- Safety
- Public Utility Plant
- Relationship contracting and conflict resolution
- Staff
- Communication.

4.1 The Brief

The most important document of the D&C is the Brief.

This document:

- Describes the proposed works;
- Defines the scope of works;
- Provides a summary of work required;
- Details the minimum design and construction standards to be achieved;
- Provides details as to design development management to ensure the design and submission process is understood and requirements known;
- Lists the Design Information and Site Information;
- List maintenance minimisation approaches;
- Provides any other technical details or requirements which impinge upon or affect the Works which are to be constructed; and
- Defines the deliverables and standards to which the Contractor is required to sign-off compliance.

The documents from which the Brief is derived, primarily the Business Case and Preliminary Design (which is referenced as Design Information), must be carefully assessed and reviewed for the inclusion of additional details, for example:

- Structures;
- Environmental;
- Geotechnical;
- Pavement materials;
- Themed landscaping;
- Interfaces with other contracts;
- Management and review processes; and
- Communication requirements.

These are all potential sources of additional requirements that must be examined for impact, responsibility determined, scope defined and the risk appropriately apportioned in the Brief.

It is essential that specific requirements that are not clearly defined in any referenced standards are explicitly stated in the Brief.

Sufficient time must be allocated to effectively review the Business Case documents, particularly if the project is complex, and where there may be interfaces created with other packages, where works may be designed but not constructed (i.e. allowing for future planning) or where particular features require additional effort such as for tunnels or busways.

The Brief must be written knowing that it will be interpreted by the Contractor. Any inconsistencies, ambiguities or vague language may result in the lowest level of interpretation being delivered.

The time spent on preparing a good Brief is not a cost, but an investment. Allocating risks inappropriately to the Contractor is a recipe for disputes, perceived Contractor non-performance, damaged relationships and long-term dissatisfaction with the project by all participants.

It is unlikely that the review task can be accomplished without some input from those who have undertaken D&C contracts in the past and thus have a practical and working knowledge of the risk allocation and requirements of a D&C contract. In this event, it is recommended that specialist advice be sought from the Director (Contracts & Standards) or the Director (Project Management Services) (MIP). Irrespective of the knowledge and experience of those who have assembled the tender document, it is mandatory that it be peer reviewed by technical experts and those persons within the Department who have the required skills, experience and exposure to D&C contracts.

Such persons should be identified and brought on line at the time the project delivery evaluation process concludes that D&C is the appropriate delivery strategy (i.e. during Business Case Development).

Maintenance is another area where the Brief should provide accurate information. The following may be considered for incorporation into the Brief to improve maintenance performance:

- Contractor to produce durability and maintenance reports for all elements of the work.
- Having a defects liability period of 10 years (preferably) or at least 5 years.
- Having a landscape maintenance period of 2 years. Landscape maintenance period to commence when all (100%) of landscaping has been completed. Landscape maintenance to include graffiti removal.

Final documentation requirements at the contract finalisation stage need to be very clear and listed in detail in the Brief (format, number of copies, contents, references).

Design conferences provide an opportunity to identify areas of inconsistency in the Brief (if the inconsistencies exist) enabling the Department to clarify its requirements.

The commencement of the contract may be long after the preparation of the Brief, during which time some specifications and standards referred to in the Brief may have changed. Therefore, action should be taken to ensure the currency of the documents referred to in the Brief at the time of inviting tenders.

4.2 Principal's Representative

Unlike in an RCC where a Superintendent is appointed, for D&C contracts a Principal's Representative is appointed by the Principal. The Principal's Representative is an agent of the Principal, who represents the Principal's interests (and consequently does not have the "independence" associated with a traditional Superintendent role), but with considerable limitations. Those limitations are constrained to the contract and to the extent the contract permits. For example, the Principal's Representative cannot:

- change, or be deemed to have changed any terms of the contract;
- wave any conditions; or
- release the Contractor from any of its obligations or liabilities under the Contract.

4.3 Independent Verifier

The D&C form of contract adopts the Principal's Representative approach for administration of the contract. This capability may be provided in-house by suitably experienced departmental officers or provided by an external firm that specialises in contract administration.

Depending on specific circumstances of a contract, the Principal may also decide on the appointment of an "Independent" Verifier. Verifiers are not a role peculiar to D&C's but may be found on a number of different contract types such as AC, ECI, DBFO, DBOM, etc.

As there are many forms of "Verifier", the actual role and responsibilities in any particular contract is as per that document that sets out the "Verifier's" role and responsibilities, rather than what may be deduced from the title "Verifier".

Verifier roles and responsibilities can vary from those of Principal's Representative in full, to quality surveillance and verification on site. The term may also refer to the "Verifier" employed by the Contractor to certify that the works are being constructed in accordance with the design.

If it is decided to use the services of an Independent Verifier, the tender documents may need to be amended accordingly and the role and responsibilities of the Independent Verifier clearly defined. It is imperative that the role and responsibilities of the Principal's Representative and the Independent Verifier are thoroughly drafted so as to avoid any inadvertent gaps/overlaps in roles and responsibilities under the contract.

It is quite common when an Independent Verifier (IV) is engaged that a tripartite agreement is entered into between the Principal, Independent Verifier and the Contractor. The need to do so will depend on the particular form of Independent Verifier role envisaged.

The advantages of using an Independent Verifier include:

- driving Contractor's behaviour to resolve design and construction issues internally without reference to or conflict with the Principal, by putting the Principal at arms length during design development and during construction;
- allowing input from the Principal through the Independent Verifier without inadvertent exposure of the Principal to claims of undue interference;
- improving the definition of the Principal's requirements in the tender documentation prior to commencement of delivery, as the Independent Verifier must ensure its role is clear rather than just a hand-over of contract administration post award to otherwise uninvolved Principal's staff;
- improving the definition of the Principal's review, surveillance, certification and audit requirements; and
- obliging all three parties to behave in accordance with clear guidelines, such that roles and responsibilities are clear and inadvertent transfer of risk does not occur.

The Independent Verifier may be selected from a panel of pre-selected Independent Verifiers by the Principal and further nominated by the Contractor (in its tender). The Independent Verifier may be paid directly by the Contractor, jointly by the Principal and Contractor or by the Principal.

When paid by the Contractor, the Independent Verifier payments cannot be altered or withheld unilaterally by the Contractor. The Independent Verifier's contract cannot be altered without the agreement of all three parties.

The Independent Verifier is required to include capability and capacity in all aspects of the work and typically involves one of the larger firms of consulting engineers. The Independent Verifier is also required to be an entity that is independent from both the Contractor and the Principal and to act independently of both parties. The Independent Verifier nominee, its personnel and its scope of work (which must as a minimum meet the specified compliance and surveillance levels in the Contract) are nominated by each Tenderer with its Tender.

The essential components of the Independent Verifier role include:

- Progressive verification of design and construction compliance with the Contract;
- Review, observation, surveillance, testing and audit of the quality of the design and construction during implementation;
- Addressing any of the Principal's comments provided in the review of submissions;
- Compliance with minimum resource levels to conduct the surveillance, review and compliance certification requirements that are included in the Contract;
- Compliance with the terms of any tripartite Independent Verifier Contract (which is usually provided in the Invitation to Tender as a schedule to the proposed Contract);
- Compliance with the scope of services that is proposed in the Tender and included in the Independent Verifier contract; and
- Making required determinations such as where the Principal has given notice that the works are not being designed or constructed in accordance with the Contract or Brief (with or without the Contractor disputing the notice).

Where an Independent Verifier is used there is a potential substantial cost to the Principal. Further, the importance of clearly defining the Brief is even greater as the Principal will get what the Brief can reliably be interpreted to mean by the Contractor (or in some cases, by the Independent Verifier) whether or not this meets the expectations of the Principal.

However, it should be noted that there are drawbacks in employing an Independent Verifier as well. Anecdotal evidence shows that the Independent Verifier process can sometimes create considerable inefficiency. Refer to Director (Contracts & Standards) if further advice is required.

4.4 Encouraging Innovation

D&C contracts have a potential to benefit from innovation due to the following factors:

- During the tender process, generally three Contractor Designer teams prepare design solutions in a competitive environment instead of the one Designer under the traditional approach; and
- Design and construction activities are flexible in a D&C as the Designer and Constructor are one entity. This helps to improve consideration of the constructability aspects of the design, both during design and construction.

Some of the strategies that can be used in a D&C contract to promote innovative approaches include:

- The ROI stage may include innovation criteria where the Tenderer can refer to past projects demonstrating incorporation of innovative approaches; and
- Developing output based specifications referred to in the Brief, rather than prescriptive specifications that provide little incentive to innovate and may restrict the Contractor's ability to realise opportunities. However, such specifications need to contain sufficient information to define the minimum standard the Principal requires, and are essentially non-negotiable. The prescriptive approach is more appropriate where there is little scope for significantly different ways of achieving the required functionality, and the Principal's concept design is for all intents and purposes adopted (or novated). In effect the D&C becomes a Document *then* Construct contract or traditional contract (RCC).

Innovation should not result in lower standards, shorter life, less functionality, increased levels of construction impacts on road users or community, or unacceptable maintenance or operational outcomes. Therefore, before accepting innovative ideas, all the relevant details and impacts should be considered, especially alternative specification and codes which may be, on closer inspection, unacceptable.

As mentioned elsewhere, a “tender contribution amount” may enable the Principal to purchase the best ideas of unsuccessful tenderers by paying for intellectual property rights in the tendered designs and making the ideas available to the successful Tenderer. In addition, design conferences are also highly beneficial in allowing the Tenderers to seek clarification on issues and confirm if alternatives would be acceptable. Such conferences provide opportunities for innovation.

4.5 Quality

In a D & C, the Department releases more control of quality to the Contractor than under a RCC. The contract needs to be tight to ensure that designer sign-off is not a means of circumnavigating the specifications. Appropriate investigations, sound planning, and more experienced personnel would reduce quality issues. The longer Defect Liability Period for a D&C also reduces quality issues as compared to a traditional RCC.

Quality of items/components procured from suppliers could be a concern. The Contract should be specific regarding the Contractor being solely responsible for all suppliers. The Department takes no responsibility for suppliers even if they are suppliers who are registered with the Department. The Department should have experienced resources to undertake checks/audits of registered suppliers and the Contract should allow random as well as scheduled inspections/audits of items supplied.

The contract should be very clear regarding hold points and Contract Administrators shall not allow works to proceed without approving hold points. The Department should ensure that hold point delegations are thoroughly reviewed at the start of the Contract and retain those hold points which are considered to be appropriate.

4.6 Safety

Safety is of paramount importance. A high level of support by senior management, prompt and proactive addressing of safety issues and maintaining a high standard of temporary works all contribute to a safer workplace and site. Focus on safety also should include safety campaigns and initiatives such as hypothetical scenario workshops, safety incident reviews, lessons learnt workshops, monthly safety awards, monthly focus areas and finish safe workshops. Reducing congestion on site and attention to fatigue management also contribute towards safety.

4.7 Public Utility Plant (PUP)

Handling of Public Utility Plant is another area where careful consideration needs to be given. Ideally the design should be finalised to the extent that third party requirements are identified and agreed in writing (possible infrastructure agreement) prior to going to tender. The requirements should be clearly documented and the relevant standards (including copies of those standards) should be included in the tender documents. The role of the Contractor in third party approvals is also required to be very clearly documented in the Contract. There is a possibility for the Contractor to claim delays or disruptions associated with third parties.

4.8 Relationship contracting and conflict resolution

A cordial relationship is vital for the success of the Contract and partnering should be considered. There are many steps that can be taken to improve relationships between parties. Design conferences provide an opportunity for initial relationship building. Once the Contract is commenced, co-locating teams in a single location could improve relationships. However, collocation should be balanced with the need for an effective independent review. This would provide more opportunities for designers to talk directly with the reviewers. Principal’s reviewers need to ensure that they raise issues at the earliest opportunity. Issues raised need to be consistent with the requirements of the Brief. Strong positive relationships between senior onsite personnel also assist in improving project outcomes. Lessons from past contracts indicate that the early removal of project team members (from any party) who don’t fit in can greatly improve relations.

Past contracts show that some contractors interpret relationship contracting to their advantage and consider relationship contracting to be about relaxing the Brief and standards. This is not the case. It is important to define relationship contracting in terms of how teams work together to deliver the

Contract in accordance with the specifications and Brief. The use of the phrase “best for project” could result in ambiguity. It should be clear from the beginning that relationships should be used to deliver the contract in line with contract requirements and not as a means to alter the contract.

Claims are unavoidable even with relationship contracting. In the case of claims, endeavours should be made to resolve them as quickly as possible or they should be escalated for resolution. Claims must also be raised in accordance with contract timeframes. Engagement of a Dispute Resolution Board (DRB) member as a project mentor who can openly offer advice to all parties is also beneficial. In selection of the DRB member, use of engineers rather than lawyers is recommended as legal representation is generally focused on legal positions rather than practical or commercial resolutions.

4.9 Staff matters

Nominated staff not available for work at times is a major concern in D&C contracts. In order to overcome this the Tender documents may specify that the Contractor has at least two back-up staff for key positions and the staff should not undertake higher roles for the duration of the project than those roles proposed in the Contractor’s offer.

With Principal’s staff, unavailability of key staff throughout the contract can be a problem. The Principal needs to ensure that permanent positions are in place for key project staff and staff should not be demobilised until their element of work no longer justifies a full time position.

4.10 Communications

Past experience shows that most effective communications with the community are through advertisements in local papers, Variable Message Signs (VMS), public displays and flyers. Radio advertising though wide spread is expensive and may have limited effectiveness. Website, messages and emails are generally inexpensive.

It is extremely important to listen to the community and understand what the community value rather than what the Department thinks the community values. Community contingency plans should be in place, especially for aborted traffic switches or traffic lane closure over-runs on motorways. Contingency plans for aborted traffic switches may include fixed and variable sign messages, community service announcements, email notifications, media contacts, SMS’s and internal notifications.

PART 5 CONCEPT PHASE

A number of tasks are required to be undertaken in preparation for the tender. The first of these is pre-work, which is discussed below.

5.1 Tender Development

D&C tender development work should commence once that delivery approach is identified as the preferred approach during preparation of the Business Case and includes the appointment of the Project Manager, the team and the preparation and signing off of the project plan. Any previous work relevant to the contract is treated as pre-work, the completion of which is necessary in order to efficiently structure and plan the delivery of the project. The volume of work required will depend on a number of factors including:

- the timeframe between the completion and approval of the Business Case and the commencement of the Development Phase of the project;
- the quality of the information provided within the previous project documentation;
- the continuity of concept phase project staff into the next phase of the project; and
- any subsequent changes or approval conditions that may affect the recommendations, scope, risk and so on, of the approved project documentation (for example from the EIS approval process).

5.2 Hand-Over

This task is completed by the Concept Phase Project Manager. Project activities are likely to have scaled down considerably for a period of time before the project is included in the Queensland Transport and Roads Investment Program (QTRIP) as a funded project. It is for this reason that the Business Case and hand-over documentation/process is critical to the successful re-commencement of the project if it has been dormant for some time.

The hand-over process requires that all relevant project related material is reviewed/referred/ filed/archived/disposed of in accordance with organisational policy. This is covered in detail as a task within the OnQ (Generic Methodology – Concept Phase).

5.3 Design Status

A D&C approach provides considerable flexibility with regard to the level of design detail provided in the tender documentation and the volume of design work expected of Tenderers. As further developments of the concept design may occur as a result of conditions or various approvals, one of the first tasks will be to consolidate all previous design work, decide on the necessary design development required and develop a Tender Evaluation Plan (MRPDS Volume 1). The nature and extent of design work expected of Tenderers will need to be determined early on and clearly documented within the tender documentation.

5.4 Preliminary Process

The following list summarises the requirements of the Concept Phase to be completed in accordance with the QTRIP Development Guidelines prior to hand-over:

- Approved Project Proposal
- Approved Options Analysis report
- Approved Business Case
- QTRIP documentation
- Budget approvals

- Other specific Department documents/forms completed during the Concept Phase.

5.5 Resumption Cost

Consideration may be given to purchase whole properties (not partial) where possible. This needs to be allowed for during the planning phase. Purchasing 'buffer areas' when ever possible is also useful. These may not add to the cost of the project as amalgamated remnant properties could be sold at the end of the project.

5.6 Team Resource Selection

Every project has specific issues and it is therefore important to consider the total project requirements when selecting the tender team.

It is important to realise that each phase of the project requires different skill sets, which means that the Project Team will invariably change during the life of the project. However, this requirement to acquire specific skill sets needs to be offset against the need to maintain some continuity of project staff for the duration of the project, as total team changes could have a disruptive effect on the morale and momentum of the project.

In order to gain the required resources for specific phases of the project, the staffing requirements should be determined early in the project and documented in the Project Plan. Approval of the Project Plan is recognition from the Principal that these are the resources required for the project. The project team is required to manage its resources across multiple skill sets throughout the life of the project.

Any shortfall needs to be identified early such that required resources can be sourced externally. The evolution of the Independent Verifier role is one instance where a lack of Principal's resources has led to the engagement of consultants.

Some projects may warrant a dedicated Design Review Manager. If one is necessary the same person should be in that role from tender preparation through to completion. Composition of the Principal's Project Management Team needs to be flexible and appropriate at all phases of the project.

PART 6 DEVELOPMENT PHASE – TENDERING PROCESS

This part covers the different stages of the tendering process, including calling for tenders and evaluating tenders.

6.1 D&C tendering process

Like any other form of contract, one of the first tasks should be to appoint a dedicated Tendering Manager (which may be the Project Manager depending on resource capability and availability, and complexity of the project) to be responsible for the management of the tendering process. MRPDS Volume 2 provides detailed information on the role of the Tendering Manager.

The D&C tendering process usually consists of two stages:

- an Expression of Interest or EOI (often called Registration of Interest or ROI) from which a shortlist is produced; and
- tender submissions and evaluation.

Before commencement of each stage evaluation plans must be developed documenting how the process is to be undertaken and managed.

6.2 Tender Evaluation Plan

As per MRPDS Manual Volume 2, a tender evaluation plan needs to be prepared before calling for ROI which should include how the tender process is to be undertaken and managed. To ensure a timely, equitable and transparent evaluation process, the plan needs to provide:

- An outline of the proposed evaluation process and procedures (detailed below);
- A uniform basis for evaluation to ensure that all tenders are evaluated fairly and none is advantaged nor disadvantaged; and
- Guidance and support for the tender evaluation panel.

The Conditions of Tender may include both price and non-price evaluation criteria. The evaluation process generally includes the following:

- Examination of tenders by the tender evaluation panel (the Panel);
- Assessment of various technical elements by technical reviewers;
- Attendance by the Panel and selected members of the project team at a formal presentation to be made by each Tenderer;
- Consideration by the Panel of the interim technical reviews provided by each of the technical reviewers;
- Scoring of each tender by the Panel, based on the Panel's own assessments and advice provided in the technical reviews;
- Evaluation of the combined technical, commercial and financial aspects of each tender, including clarification of tenders in accordance with documented procedures;
- Assessment by the Panel and selected members of the project team and selected technical advisors of the likely risks and opportunities to the Department of awarding of the contract to each of the Tenderers;
- Evaluation of the Risk Adjusted Comparative Price for each tender;
- Reality testing by the Panel and revisiting of non-price or price assessments based on further information, ongoing clarifications or further reports received from the Tenderers or technical advisors during the assessment period;

- Determination of a recommended tender by the Panel based on the price and non-price assessments;
- Confirmation that commercial qualifications/clarifications with Tenderers have been finalised; and
- Preparation of a Final Evaluation and Recommendation Report by the Panel which details the assessment process and reasons for selection of the recommended Tenderer.

6.3 Expression of Interest/Registration of Interest

The Major Works Prequalification System (MWPS: Volume 3 of MRPDS) should be used as a guide to set mandatory requirements for prospective Tenderers (by adopting an appropriate prequalification level).

Where the D&C contract value or scope of works is outside that of the MWPS (\$250M), an open ROI is recommended to identify and obtain an understanding of the market capability to deliver the required services. The scope may be outside that of the MWPS because of project requirements such as tunnels, cable stayed structures, extended defects liability periods, extended maintenance and operation periods or combination of design and construction abilities beyond road/bridge/hydraulics.

The evaluation of the ROI is conducted as for a typical non-financial assessment (Refer to the MRPDS – Volume 2). The expressions of interest are evaluated against the criteria, scored and ranked using non-financial assessment principles and processes.

When considered necessary, the Panel should review the evaluation criteria during development and prior to inviting tenders. This will allow the Panel to "value-add" to the identification and development of the evaluation criteria because, generally, Panel members possess considerable experience in tender evaluation and tender processes. The input can assist to clarify possible ambiguities and assist the identification of relevant criteria and weightings.

The following information is generally assessed:

1. Information received from applicants given in the application form and schedules;
2. Details from applicants and Designer's prequalification applications;
3. Information held or available to Transport & Main Roads on the applicant's and the Designer's previous performance; and
4. Financial capability information if requested.

With regards to financial capability, in certain circumstances, and invariably for the larger dollar value projects, financial assessment of the Tenderers is also undertaken and should be an integral element of the short-listing process. Independent expert financial advisors are required to undertake this activity which is performed separately from the other evaluation activities.

These financial assessments are performed having due regard to the commercial in-confidence nature of the provided financial data, requiring confidentiality agreements to be signed by all those involved in the evaluations. A Probity Advisor may be employed to monitor the process and provide independent confirmation that probity has been achieved throughout the process. It is important that probity does not constrain the process, resulting in poor outcomes.

Financial assessment of applicants is to be distinguished from the financial evaluation of the tenders, the latter consisting of a consideration of the Tendered Lump Sum, day works rates, delay rates, etc.

Where related companies are short listed, they may be required to, amongst other things, advise what internal arrangements and procedures they propose or have implemented to address and resolve probity and competitiveness issues.

Following are some of the learnings from previous projects worth giving consideration:

1. If the Consultant used by the Principal for planning work detailed in ROI brochure responds they may be seen to be getting an unfair advantage. This could be avoided by either including a term in their prior consultancy prohibiting tendering or by identifying that consultant in the ROI brochure for all applicants to be aware of.
2. It is advisable to request a matrix from applicants setting out the identities and contact details of the principal entities which comprise the applicant and which are proposed to be a part of the project team.
3. Transparency is a key characteristic of a public sector invitation process. Therefore, it is necessary that all enquiries be in writing so that they can be shared, subject to commercial-in-confidence considerations. This is usually achieved by providing an email address for enquiries (without a telephone number) in the ROI brochure and including a condition that the enquiry will not be considered as having been received unless acknowledged by the Principal. The Principal has the right to publish any enquiry and the response to all applicants that has been provided with the ROI brochure or subsequent information to Tenderers notifications, except in commercial-in-confidence circumstances.
4. Significant effort spent on the assessment of offers that are unlikely to be successful is counter productive and a waste of resources. It is advantageous to undertake an initial review (price and non price) and prepare an initial shortlist, then focus on the tender that are more likely to be successful.
5. When using non-price criteria, it is recommended to use project specific selection criteria and focus on staff capability (and back-up/replacement staff). Focussing on mandatory requirements such as quality, environment, safety, claims history and organisational capability (these are either acceptable or not acceptable) may not add much benefit.

Sometimes the Registration of Interest is scoped first to merely gauge the availability of firms, and only provides a list from potentially prequalified firms as to their desire to submit an Expression of Interest in the future.

6.4 Preparing the Tender Documents

Preparing the tender documents requires the assembly of various relevant forms and their completion where required by the Principal, by insertion of appropriate details.

The most important document in the D&C tender document is the Brief. This document sets out, amongst other things, what outcomes the D&C Contractor must satisfy and such matters as the:

- Purpose of the Works
- Scope of Works
- Design Standards of the various elements
- Construction Standards
- Design Information

While the Brief is project specific, many treatments of various elements are given a standardised approach.

The documents from which the Brief is derived, primarily the Business Case and Preliminary Design (which is referenced as Design Information), must be carefully assessed and reviewed for the inclusion of additional details, e.g. environmental, geotechnical, pavement materials, themed landscaping, interfaces with other contracts and project communication impacts and processes. These are all potential sources of additional requirements that must be examined for impact, have responsibility determined and scope defined, and must be appropriately apportioned in the Brief.

Should specific requirements of the Business Case and Preliminary Design require compliance by the Contractor, those requirements should be detailed clearly in the Brief as minimum requirements to be provided by the Contractor. Merely leaving those details in the Design Information is not sufficient to achieve the requisite level of certainty.

There is a greater need to allocate the time to effectively review these documents if the project is more complex and there are a large number of packages and subsequent interfaces created. The time spent here is not a cost, but an investment. Allocating risk inappropriately to the Contractor, due to inadequate review of the planning phase documents, is a recipe for contractual dispute, perceived Contractor non-performance and long-term dissatisfaction with the completed asset.

It is unlikely that this task can be accomplished without some input from those who have undertaken D&C contracts in the past for the Department, who thus have a practical and working knowledge of the risk allocation and requirements of a D&C contract.

Irrespective of the knowledge and experience of those who have assembled the tender document, it is mandatory that it be peer reviewed by those persons within the Department who also have the required skills, experience and exposure to D&C contracts. Such persons should be identified and brought on line at the time the project delivery evaluation process concludes that D&C is the appropriate procurement strategy (preferably during the Concept Phase and leading up to the development and documentation of the Business Case).

Incorporating learnings from previous projects will enhance the success of the contract.

6.5 Offer Contribution Amount

The Conditions of Tender allows for an Offer Contribution Amount (Clause 15 (d) of the Conditions of Offer) to be paid to Tenderers for use by the Principal of any Intellectual Property that may exist in their Tenders. This permits the maximum use of any innovative concepts that may be identified. The Principal may decide to make an offer contribution, for example, in the following situations:

- If the preparation of tender documents is costly, the Principal may decide to provide some level of compensation for the cost of tendering. This is particularly used in cases where the preparation of extensive studies or costly materials is required to undertake an adequate design sufficient for it to be costed for tender purposes; and
- A contribution may also be made in cases where the Principal decides they may wish to acquire intellectual property rights of the Tenderer's design or construction methodology.

The amount of the contribution depends on several factors, such as the cost of the contract, complexity of the design and the necessity to undertake further studies. The Director (Contracts and Standards) may be contacted for advice to decide on the offer contribution.

6.6 Tender Evaluation

The Tender requirements in regard to tender designs to be submitted for evaluation are worthy of specific mention. At the time of Tender, the Contractor will not be in a position to have a completed design to fully cost or to provide full details for assessment, unlike the tender process for a Road Construction Contract. As such, a preliminary tender design is prepared sufficient for costing and preparation of various outline plans required to be submitted with the Tender (such as those for traffic, environmental, program, etc).

Tender evaluation involves risk and uncertainty as these plans have not been fully developed. Many of the tender evaluation criteria thus may use such relative terms as “high confidence of achieving project contract outcomes” rather than specific evaluation criteria “hurdles”.

The usual items to be included in a preliminary tender design are geometric design (vertical and horizontal alignments, cross-sections and layouts), bridges, any noise amelioration devices, landscaping concept, lighting concept, preliminary regulatory traffic and direction signing, layout of any retaining walls, pavement design showing calculations, assumptions and design life criteria and any proposed changes to the design standards or to the Brief.

Non-financial assessment criteria are quite extensive with around 18 elements to be addressed by the Tenderer. Due to the nature and extent of the evaluation to be undertaken, the assessment panel

(usually 3 members with an independent member) needs to be supported by specialist advisors from the Department. These advisors should be the staff who are suitably experienced in the appropriate field to provide technical assessments of the preliminary design, risks and uncertainties and any other matters that impact on the risk allocation including design life, operational aspects and whole of life considerations. These other matters include design standards, staff competencies and experience including known performance of the Contractor on projects for the Department or other customers.

Referee checks are made by the evaluation panel on proposed key personnel and on previous projects detailed by Tenderers. Checks on referees not nominated by the Tenderer but known to the Department often give more insight than nominated referees. The contract documents should state that non-nominated referees may be contacted. An outline of the tender evaluation process is shown in Figure 1.

A typical Tender Document, as assembled for a road and bridge project, is contained in Appendix A. Any question marks “?” placed throughout the document indicate places where project specific information may be required or acts as a reminder. Occasionally a “?” also occurs as a prompt for other information (such as for a tunnel or other project specific requirements).

Tender assessment and evaluation forms are contained in Appendix E.

For D&C procurement requiring extended defects liability periods, routine maintenance strategies, rehabilitation strategies and whole of life costing of alternative pavement treatments singularly or in combination, suitable D&C documentation is available. However, due to the specialist nature of such requirements, they are not included here. If such documentation is required for your project, contact the Director (Contracts & Standards) of Engineering & Technology.

Evaluation Process Outline

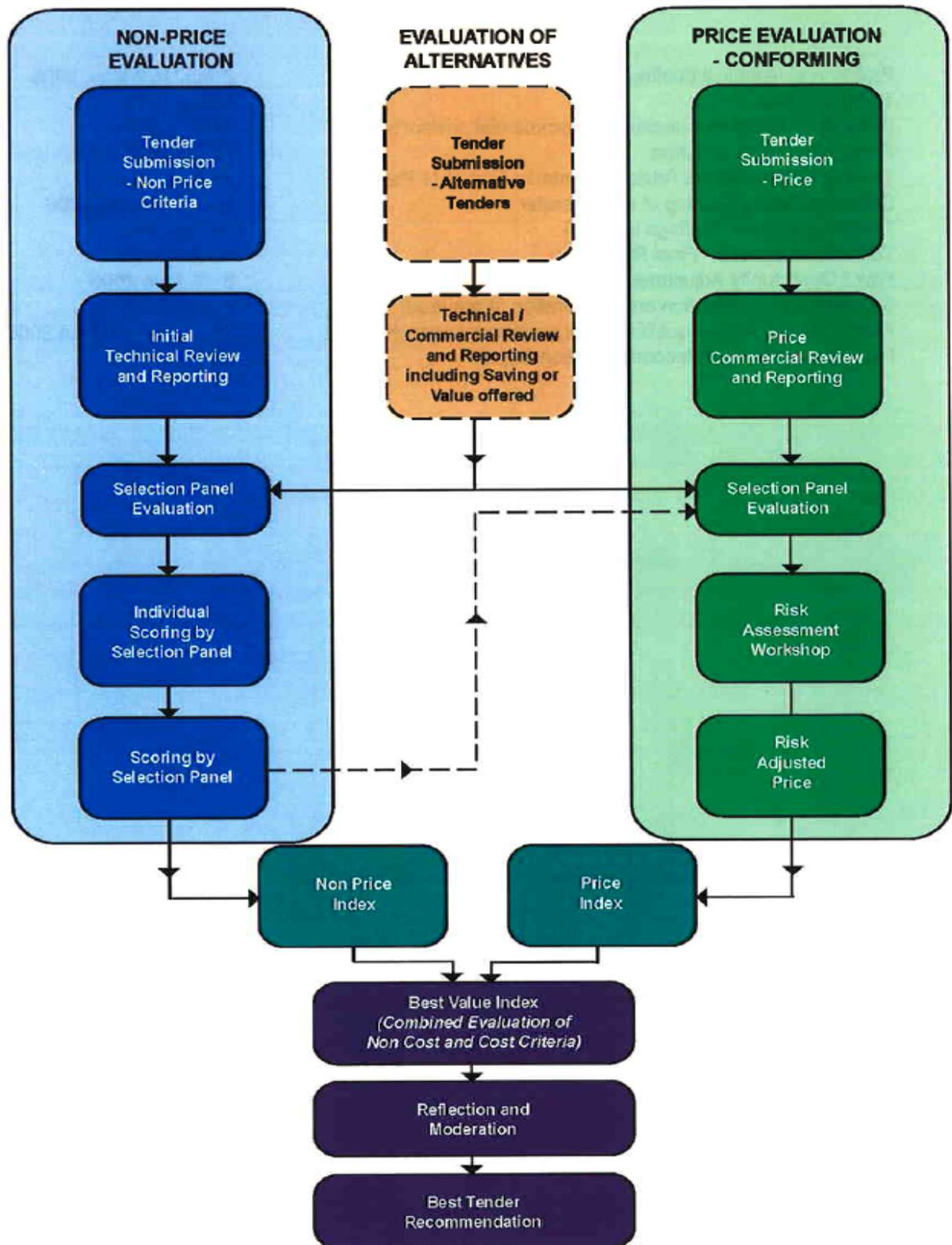


Figure 1: Tender Evaluation Outline

6.7 Considerations in D&C Tender evaluation

Unique characteristics of a project may require greater consideration of a number of aspects of the standard approach to the tender evaluation process. Some example considerations are detailed in Table 1 below.

Table 1: Tender Process Considerations

No	Issue	Recommendation
1	The D&C approach could be time and resource intensive for both TMR and private industry	<ul style="list-style-type: none"> Resource requirements must be carefully considered in assessment of whether a D&C is the most appropriate delivery method. The Principal must confirm it has the experience and resources to undertake its tasks.
2	Registration of Interest (ROI) process could result in difficulty differentiating between applicants	<ul style="list-style-type: none"> Mandatory prequalification requirements such as quality, systems, environment, communications and past performance should not be rated when evaluating responses. This would have been attended to in the ROI process. The Tender evaluation criteria should be more project specific. Develop selection criteria that are project specific and less generic – for example, relevant design and construction experience of project personnel (not organisational), demonstrated relationships performance, levels of resourcing and depth/experience of back-up staff, staff availability, demonstrated understanding of the project needs and challenges
3	Due to the potential for a significant time lapsing between close of ROI and close of Tender, Contractor's staff could change and skills could be diluted between ROI, Tenders Release and Implementation	<ul style="list-style-type: none"> Consider including terms that require the Contractor replacing personnel between ROI and Tender award to replace the personnel with personnel with the same level of expertise
4	For larger contracts, the cost of Tender evaluation is significant to the Department.	<ul style="list-style-type: none"> Consider allowing adequate and appropriate levels of resources and budget for the Tender evaluation phase, in consideration with resource demands from other concurrent projects
5	Tendering costs can be significant	<ul style="list-style-type: none"> Consider reimbursement through the Offer Contribution Amount
6	For larger projects the time allocated to assess Tenders could be very tight	<ul style="list-style-type: none"> For larger projects, a longer Tender validity period (for e.g. at least 6 months) should be considered
7	There could be difficulties in differentiating between parties on Non-Price Criteria during Tender Evaluation, unless certain precautions are taken.	<ul style="list-style-type: none"> Include mandatory pass/fail requirements in the Tender evaluation for areas such as quality, systems, environment, relationships, etc Develop criteria targeted on key features of the project to aid in the differentiation of responses
8	Inadequately developed and documented Business Case. As the Brief is developed from this document, it is essential the Business Case be robust and thorough.	<ul style="list-style-type: none"> Appropriate effort is given to developing a Principal's Concept Design and Business Case Sufficient investigation and concept design work undertaken to be confidently able to define the required functionality, scope of works and objectives of the project

No	Issue	Recommendation
9	Impediments to communications between the Department and Tenderers.	<ul style="list-style-type: none"> • Using the Request for Information process goes only some way in enabling communications between the Department and Tenderers • Including Tender Conferences in the Conditions of Tender CoT (additional clauses) may be considered to increase the effectiveness of communications commensurate with the project characteristics. These can be in group sessions or with individual Tenderers. The Probity Advisor should be present at all such conferences.
10	Best use of available Principal's resources	<ul style="list-style-type: none"> • The following may be considered depending on project complexity and if so should be documented in the Tender Evaluation Plan (TEP), noting that at all times the terms of the CoT must be complied with by the Principal: <ul style="list-style-type: none"> - An initial broader review of Tenders focussing on general functionality and conformance. This can be achieved relatively quickly - Specialist and detailed reviews should then focus on conforming Tenders in contention thereby maximising the use of time and resources in consideration of those Tenders which may offer better Value for Money over those that do not
11	Considerations of Key Stakeholders	<ul style="list-style-type: none"> • Key Stakeholders' concerns should be captured in the specialist reviews of any aspects that may be contentious, or from any aspect of any alternative that Tenderers may have proposed that departs from the Tender Documents or from what was anticipated by the Business Case

PART 7 IMPLEMENTATION PHASE – CONTRACT ADMINISTRATION

Contract administration starts once the contract is awarded although preparations should occur well beforehand as there are many activities required to be undertaken which require some effort to progress.

Contract award occurs with the issue of the Letter of Acceptance by the Principal. It is the responsibility of the Principal's Representative to ensure the Contractor discharges its obligations and responsibilities under the Contract and to issue any directions that the Principal's Representative is entitled to give pursuant to the provisions of the Contract.

This section discusses key issues that are relevant during administration of the contract.

7.1 General

Contract administration is the day to day undertaking of those activities that support the Principal's Representative in the discharge of its duties under the Contract and the fulfillment of contractual obligations between the Principal and the Contractor. Contract administration of a D&C contract may be carried out internally using Officers of the Department or by externally engaged consultants, in a similar manner to delivery via the Road Construction Contract.

Contract administrators do not replace the role of the Principal's Representative.

Should consultants be employed, then their roles and responsibilities must be clearly defined in the Consultancy Brief so that functions of the Principal's Representative retained by the Department are not compromised.

In either case, a good understanding of the contract particulars is required to enable proper and timely discharge of administrative duties. In particular, a thorough working knowledge of the General Conditions of Contract, Annexures, the Brief and design and construction standards are essential prerequisites.

7.2 Contract Administrator Selection

Should contract administrators be internally selected, it is important that they be appointed as early as possible in the project to obtain a thorough understanding of the required outcomes. Development of the appropriate surveillance plans and contract administration documentation and systems to be employed can be commenced early. Early involvement in the documentation development and offer assessment is an excellent means of achieving these outcomes.

Alternatively, external selected contract administrators will require an additional and separate tender process for their appointment. It is important that they be engaged at the earliest possible time so that the contract administration team can attain the required level of knowledge of the project and documentation requirements prior to actual commencement of the construction contract. Selection criteria should include a requirement to demonstrate, amongst other criteria, exposure to D&C type contracts, familiarity with D&C terms and conditions and ability to develop and document effective surveillance plans.

Many consultants employ proprietary contract administration systems not used by the Department and adequate time should be allowed to achieve alignment with the Department's requirements and the particular contract.

Involving internal administrators in the documentation and tender assessment of the constructor provides an opportunity for an early and timely entry into the project.

7.3 Role of the Principal's Representative

The Principal's Representative is appointed in accordance with Clause 23 of the General Conditions of Contract.

The Contractor is required to execute the work under the Contract in accordance with the Contract and any directions which the Principal's Representative is entitled to give under the Contract.

Such directions do not relieve the Contractor of any of its obligations or liabilities under the Contract. The General Conditions of Contract expressly prohibit the Principal's Representative from amending, altering or waiving any terms of the Contract or to discharge or release the Contractor from its obligations or liabilities under the Contract.

The Principal's Representative may from time to time appoint other persons as Principal's Representative's Agents to exercise those powers vested in the Principal's Representative, although not more than one agent can exercise the one function at any one time.

Key duties exercised by the Principal's Representative (or its appointed agent) include:

- Issuing directions as to suitability of documents submitted by the Contractor (Clause 8)
- Reviewing design submissions by the Contractor and granting or with-holding Permission to Use (PTU) (Clause 9)
- Directing the Contractor as to defective materials or work (Clause 30)
- Examining and testing materials and work (Clause 31)
- Deeming the Contractor's program suitable or unsuitable (Clause 33)
- Assessing claims for delay or disruption (Clause 35 & Clause 36)
- Varying the work if required (Clause 41)
- Assessing progress claims and issuing payment, practical completion and final certificates (Clause 44)

The above list is not exhaustive and refers only to a selection of clauses in the General Conditions of Contract.

It is worth mentioning that as a D&C is a Lump Sum contract and thus has a Schedule of Prices, rather than a Schedule of Rates, the valuation of progress claims is far more complex than for a traditional RCC.

To assist with the valuations process, the following may be useful:

- the Schedule of Prices;
- material invoices provided by the Contractor;
- milestones and payment amounts directly related to the achievement of those milestones; and
- separate Portions.

As each has its own characteristics, suitable advice in their use should be obtained.

7.4 Surveillance Plan

It is imperative that an appropriate surveillance plan be developed and documented by the contract administrators and that it be fully integrated with that of the Principal's Representative's functions. The plan should thoroughly review the requirements under the Contract, identify the various submissions required by the Contractor and incorporate required time periods within which a response or action is required, and manage hold, witness and test points to the required standards.

There are a number of time defaults under the contract which, would enable Permission to Use to be deemed granted if the time period for a response has expired (14 days) without a review of the submission actually occurring. There is a danger that the opportunity to review is lost or at least

compromised if the Permission to Use process is not proactively managed or a sufficient period of time for review, that is reflective of a particular project's characteristics, is not stipulated in the contract.

Similarly, the surveillance plan needs to identify the requirements of the design and construction specifications and technical standards for submission requirements, timeframes and the threshold test results that indicate achievement of the performance requirements.

Although the surveillance task is simplified if the Department's standards are adopted as minimum standards, it may not be sufficient in some cases. Adequate time needs to be allocated for the Contract Administrator to develop the required surveillance plans prior to award of the construction contract.

7.5 Other considerations

Some contracts are highly complex with a large number of line items. It is advantageous for the department to employ its own estimators for such contracts to review contractor's estimates rather than relying only on a third party independent reviewer.

PART 8 FINALISATION PHASE – CONTRACT FINALISATION

This part discusses important issues during the contract finalisation.

8.1 Process at hand-over

The process to achieve hand-over, closure, review and evaluation, consists of a number of activities which include:

- Inspection and dealing with defects;
- Hand-over of the completed asset to the Principal, including any maintenance manuals or guidelines;
- Completion of various project reports and the collection and archiving of specified documents required by the Principal; and
- Final quantities reconciliation and payment, finalisation of outstanding paperwork and closure of the office.

8.2 Practical Completion

There is a contractual obligation for the Contractor to complete the works under the Contract to Practical Completion by the Date for Practical Completion, taking into account any extensions of time that may have been granted.

There are contract conditions associated with Practical Completion that the Contractor must comply with. The Contractor must hand-over a number of documents, including:

- All Guarantees and Warranties required by the Contract;
- Three (3) sets of as-built drawings and specifications;
- Certificates from the Designers (signed by a principal of each Designer);
- Copies of all investigative reports carried out by the Contractor or its agents in connection with the Contract.

A number of non-contractual documents and reports need to be provided to the Principal from the Principal's Representative. They include the following:

- The Contractor's Performance Report;
- Post Construction Report;
- Post Implementation Report on Designer;
- Relevant data to be provided for ARMIS;
- Arrange for project learnings to be recorded in accordance with TMR procedures (OnQ Finalisation Report).

It is important to remember that Practical Completion occur when the Works can be (safely) used for intended purposes. The Principal's Representative and Contractor should, in anticipation of achieving Practical Completion, jointly inspect the works and prepare a list of defects and omissions to be rectified by the Contractor.

Upon issue of the Certificate of Practical Completion, a series of events/activities are triggered, some of which are given below:

- The Defects Liability period commences;
- Within 56 days, the Contractor prepares and submits a semi-final statement setting out details of all Claims which have not been settled or resolved;
- The Contractor prepares and submits a payment claim;

- The Principal reduces the value of the nominated securities by a prescribed (usually the Retention Security with the Primary Security maintained until the Final Certificate) as certified in the progress certificate at Practical Completion;
- Liquidated Damages apply for each day past the Date for Practical Completion;
- The Principal's Representative prepares the Contractor's Performance Report, the Post Construction Report and the Post Implementation Report on the Designer.

Practical completion should not be granted until all conditions required under the Contract have been met. If Practical Completion has been achieved without considering the above reports, etc, many issues and documents may not be closed out for many months, if not years. The Department also should not demobilise key staff until the project has been closed out.

8.3 Final Certificate

The Defects Liability Period expires after one year for most D&C contracts although other periods may be preferred by the Principal due to the characteristics of the project. Within 28 days after the expiry of the Defects Liability Period, the Contractor has to prepare and submit a Final Statement.

If the Contractor has fulfilled all of its obligations under the Contract. The Principal's Representative then issues a Final Certificate for final payment. The Principal or the Contractor has a further 15 days to serve a notice of dispute, otherwise the Final Certificate is evidence between the parties that the Works have been completed.