

# UNFORESEEN GROUND CONDITIONS AND ALLOCATION OF RISK

## Before the Roof Caved In

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*If during the contract the Contractor encounters on the Site physical conditions which ... could not reasonably have been foreseen when tendering by an experienced contractor and which will ... substantially increase its Costs ... the effect of such conditions ... shall be treated as if it was a Variation.*

Clause 9.5  
Conditions of Contract for Building  
and Civil Engineering Construction  
(NZS3910:2003)

### 1. Introduction

You will all appreciate, I hope, that the views I express here are mine, as are all the errors. This paper is also more an expression of opinion, rather than a definitive summary of the law.

When representing clients or advising on projects, you will also appreciate that the views I express might not be my own, and might differ from what I say here. The only thing you can be sure of, when some of us do cross paths in future, is that I will have discussed a number of the views expressed in this paper with my clients. You will understand if I take a contrary view at that time, and that you will not hold it against me!

For reasons of client confidentiality, I hope you will understand if I am a little reticent about recent projects.

#### *Nature of Risk*

In the construction industry, we hear many adages like “*project risk should be allocated to the party best able to manage it*”<sup>1</sup>. While commendable, truisms like this do not do justice to the complexities or the subtleties of allocating risk in large construction projects.

Risk is not static<sup>2</sup>. It changes through the construction process at a number of different levels – likelihood, avoidability, severity, downstream impact, foreseeability, manageability and value spring immediately to mind, and yet traditional tendered lump sum contracting procedures force contractors to commit to certain outcomes at a time of greatest uncertainty in a competitive environment<sup>3</sup>. The common thread in any analysis of allocation of risk is identifying initial uncertainty, how responsibility for that uncertainty is allocated, and what to do if the risk associated with that uncertainty does eventuate.

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<sup>1</sup> See Max Abrahamson *Risk Management* [1983] ICLR 241

<sup>2</sup> See Davis Langdon, *Industry Cost Commentary*, Australia (2000) Costpoint, June 2000 for a discussion of risk, generally.

<sup>3</sup> For a wider discussion of the difficulties inherent in the tender process, see John Walton *Avoiding Construction Disputes – Just a Matter of Price?* [2005] NZLJ 215, available for download from <http://www.johnwalton.co.nz/publications.html>

### *Uncertainty*

The first step must always be to identify the project uncertainties.

For unforeseen physical conditions, this typically involves geotechnical investigation. Only once the ground condition is understood, and the uncertainties identified with as much clarity as possible, can the parties engage in a productive discussion about allocation. The quality of that discussion will depend on the skills the parties bring to the table.

For the construction of the Tsing Ma bridge, which links the new Route 3 interchange to the expressway leading to the new Chek Lap Kok airport in Hong Kong, the deck segments were to be put in place from the middle of the span out towards the towers. Each deck was to be prefabricated in China, and would be 40 metres or so long and would comprise 3 lanes in each direction on the top deck, with the railway line and all weather lanes in the covered section underneath. At one stage in the construction, almost 1.3 km of deck would be slung from the main suspension lines, but not finally attached to the towers. In that context, the Government insisted that weather conditions should not be allowed as ground for extension of time or other claim.

We asked how this would be viewed as being fair when Hong Kong regularly suffers from extreme weather events. The response was relatively simple – the typhoon season runs from June to September (more or less), and there is considerable data about this. While the contractor cannot manage the weather, it can manage the works to avoid extreme weather events, particularly for high risk activities like slinging the deck off the main suspension lines.

The converse situation was less attractive could have resulted in a contractor having no ownership over this risk, and no incentive to avoid or mitigate the effects of weather. Such was the risk of delay with the impending hand-over to China, and the liquidated damages at stake, that without this provision the Government felt that a contractor might take a risk on the weather, and programme the works without regard for the typhoon season.

It is not enough to simply identify the uncertainty, and provide for an entitlement to claim. It is an integral part of that consideration to ask if the uncertainty can be rendered irrelevant by revising the design, construction method and/or programme, and to then give ownership of those measures to the relevant party.

### *Process and Allocation of Risk*

It is incumbent on all parties to a construction contract to reduce the level of uncertainty so far as they can.

This may not lend itself well to traditional fixed price competitive tendering, under which bidders are encouraged to withdraw tags and provide unconditional tenders. Under these arrangements, bidders price for uncertainty in a competitive environment, which regrettably rewards aggressive or even reckless tendering. This translates into perhaps a more optimistic view on recovering costs during construction, or managing risk through the claims procedures.

While I have reservations about traditional tendering guaranteeing good outcomes, and its long term impact on the construction industry, it would be a mistake to take from this paper that collaborative working arrangements, alliances or target cost options from NEC3 are the answer, either. One of the main objectives in any award process should be removing

(or reducing) uncertainty, allocating risk sensibly and providing a framework to manage the genuinely unknown in a manner which maximises the skills of the parties, and is in the best interests of the parties (preferably within budget).

In my view, this can only be done with a thorough understanding of the extent of the uncertainty, and contracts and processes which deal with those uncertainties as necessary. A broad brush approach, whether using blanket allocations or more general collaboration frameworks, have the potential not to properly address the parties needs for certainty or to make the most of the skills the parties bring to the project.

#### *Ownership of Risk*

We often hear of ownership of risk, whether it is the employer or the contractor who owns the risk. I appreciate that this is shorthand for whether or not the contractor will be entitled to be paid if a certain risk eventuates, but it also creates a misleading assumption that the parties are in some way equal partners. They are not.

The employer is paying for the development of an asset, whatever the cost may ultimately be. The entirety of the project is at the employer's risk, reflected in price and quality.

The contractor is providing a service to the employer for payment. The issue is whether or not it is sensible for the contractor in providing those services to accept certain risks. In determining that issue, the objective should be to maximise value from the contractor's skill and resources. It is not sensible to allocate risks to the contractor which it cannot properly assess, manage or price, simply because you can (because of market forces, or any other opportunistic reason). While the contractor may not be entitled to claim under the contract, this does not mean that it won't claim, or that it won't seek to recover losses elsewhere in the contract though reducing costs and resources, or making claims elsewhere.

#### *Roles of the Parties*

Having identified the project uncertainties, those risks which cannot realistically be avoided need to be fully understood before they can be allocated. The risks to the project are frequently more specific than the standard forms allow, and the skills of the parties in dealing with those risks will vary considerably.

Let me illustrate this point by reference to a particular project. One of the 70 Airport Core Programme projects undertaken by the Government of Hong Kong as part of the Chek Lap Kok airport development was the third cross harbour road tunnel, linking the new airport expressways to Hong Kong Island (the Western Harbour Crossing). Like all tunnel projects in Hong Kong, the Western Harbour Crossing was to be developed under a 30 year franchise, which included obligations to build, own, operate and transfer (a BOOT project).

Historically, the franchisees in BOOT projects are made up of the promoter, the financier, the construction contractor and the operator. There may be others, but this was the typical list of culprits. Many of these privately financed infrastructure initiatives also grew out of a desire by some cashed-up contractors to participate in the overall success of projects.

For the Western Harbour Crossing project, there was considerable concern that allowing the contractor to be involved in the franchise agreement would distort the negotiations, as its interests were relatively short term. The successful franchisee for that project did not include the construction contractor; that role was the subject of a separate, arms-length construction contract, negotiated by the successful franchisee.

While there is a brief period of mutual interest between the employer and the contractor, the roles and expertise of the parties is different, and the allocation of risk must reflect that. Granted there is mutual interest in a successful project, but it would be a mistake to say that all risk can be shared.

#### *Habitual Allocation*

As creatures of habit, and out of the same desire to avoid the unknown, the industry is inclined to follow established patterns, preferring formal tender processes for fixed price contracts using standard forms. These have the benefit of familiarity, if not certainty. In a similar vein, the industry complains about the overuse of special conditions and we are warned that departing from the printed word in published forms can have unintended consequences, destroying the niceties of the original drafters' intentions<sup>4</sup>.

Far be it for me as a contract draughtsman to disagree with this injunction, but it does assume that a one-size-fits-all approach is always appropriate. An unintended, consequence of slavishly following standard forms or any standard procedure for that matter is that critical decisions are then made for us without realising what they are, or why we make them.

Once risk has been identified and properly explored and considered, the contract should provide a framework for dealing with that uncertainty. That framework will vary from project to project, and the contract should be revised accordingly.

#### *Change in Approach*

It is also important to acknowledge that we are in a period of change. To a large degree, the current government's attitude to allowing (or should I say disallowing) private funding for infrastructure has insulated New Zealand from a lot of the changes occurring in general construction contracting occurring overseas, and in particular in the UK.

Traditionally, the client appointed consulting engineers for its proposed project. Those engineers prepared designs, drafted contract documents, invited tenders, advised on award, represented the client during construction, provided additional designs and instructions as required, and then was the first port of call for disputes. This remains the approach in NZS3910, and generally the profession has discharged its duties well, notwithstanding the truly numbing conflicts of interest.

That position has shifted somewhat, with the growth of design and construct contracting, and latterly with the frenzy in other jurisdictions for public private partnerships (PPPs). The difficulty with PPPs is that the franchise holders, typically large banks and investment funds, require certainty, and did not initially understand risk, beyond an ingrained desire to avoid it. This led to extremely aggressive allocations, not based on identifying risk, and capitalising on the skill levels of the parties, but on an overwhelming desire for certainty. This was expensive contracting. To make matters worse, the perception of certainty was an illusion and the early construction risk was distorting the assessment of risk for the entire franchise period. Not surprisingly, when that risk was factored into the life of a typical franchise, the UK Government responded badly to the truly stupendous returns on

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<sup>4</sup> See Chris Farhi *The Analysis of the Potential for Use of the New Engineering Contract in NZ Construction*, a University of Auckland research paper, available to member of the SCL for download from [http://www.constructionlaw.org.nz/membonly\\_papers.asp](http://www.constructionlaw.org.nz/membonly_papers.asp)

some projects (notably, prisons), and it required a separation of construction risk from operational risk in franchise agreements, and it included a claw-back in its standard PPP provisions.

There is now greater acceptance that a robust and realistic allocation of risk will ultimately result in a lower overall project cost. Some level of mutual risk “sharing” is now becoming the norm in major overseas projects, and here. “Sharing” is perhaps misleading in this context. It would be better to think in terms of risk separation and more detailed identification of project uncertainty and allocation.

I appreciate that reviewing each project from a clean sheet of paper is not for the faint hearted, but then it does make life more interesting. Hopefully it also means that we fully use the skills that we are paid for. As construction specialists, we have the benefit of an extensive variety of published forms, and the experience of previous projects to guide us. If there is one message to take from this discussion, I hope it will be that the starting point for a successful project is for the drivers for the project to be settled, the concerns of the parties to be understood and addressed, and risks to the project fully investigated and allocated to the appropriate party, rather than a strict set of procedures and standard forms rigidly adhered to.

In this first session, we will be looking at allocations of risk for unforeseen physical conditions, and what the impact of those allocations are on the formation of the contract, and contract administration up until the point where an event occurs which may or may not give rise to a claim. The second session will deal with managing events and claims.

## 2. **Standard Approach**

The common law position is that, without an express provision to the contrary, ground condition risk rests with the contractor like any other physical condition or buildability issue<sup>5</sup>.

### *Foreseeability*

The standard approach, as shown from the selective quote of NZS3910 above, is for the contractor to be compensated with an extension of time and payment of direct cost, overhead and profit for *unforeseen* physical conditions which cause delay or cost. Similar wording is used in most standard forms<sup>6</sup>, with each taking slightly different approaches depending on their jurisdictions.

The draughtsmen of the NEC 3 have taken a different tack by referring to conditions which an experienced contractor would have judged “*to have such a small chance of occurring that it would have been unreasonable*” to have allowed for them. While this turns the assessment on its head, we are left with making a judgment on what the contractor objectively may or may not have assessed as being significant<sup>7</sup>, which brings in similar considerations as to whether or not a matter should have been foreseen.

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<sup>5</sup> See *Thorn v London Corp* (1876) 1 App Cas 120

<sup>6</sup> See clause 35 of SCC1, clause 12 of ICE and clause 4.12 of the FIDIC Red Book.

<sup>7</sup> See clause 60.1(12), in the definitions of compensation events.

Issues will revolve around what an experienced contractor might or might not foresee, and once foreseen, whether or not the risk is likely to eventuate; which is an underlying assumption in all the drafting. The difficulty with this formulation is that the test of *foreseeability* will be undertaken after the event. As we all know – hindsight is a dangerous thing. FIDIC tries to lend certainty by including a definition of *unforeseeable*; a noble concept, but the actual definition “*not reasonably foreseeable by an experienced contractor by the date for submission of the Tender*”<sup>8</sup> doesn’t really get us far.

In my view a number of factors should be taken into account when assessing *foreseeability*<sup>9</sup>:

- (1) information in the public domain at the time of tender;
- (2) information provided by the employer, typically in the form of geotechnical investigation data, and perhaps interpretations of that data;
- (3) the results of the contractor’s own pre-tender investigations; and
- (4) the mythical contractor with all the above information, experienced in similar projects with the time, resources and inclination to consider what might or might not be foreseeable (this is a hard beast to pin down).

There is little or no case law on this point, and regrettably the opinions of experts have rarely assisted in resolving this issue. In my experience, all too frequently in arbitration the most compelling evidence of what was *foreseeable* is what the contractor actually allowed for! While convenient, this rather flies in the face of the contractual intent.

One useful tool in this assessment is to require bidders to submit all the data used in preparing the tender, including detailed costing information, within a few days after submitting the tender. This information can be checked for compliance on submission, and is then held in *escrow* and used only for determining disagreements about claims and settling the value of variations. While many may have concerns about the misuse of what can be sensitive information, appropriate controls can be put in place to ensure that these documents are not misused.

### *The Unexpected*

The underlying policy of the standard clause is that the contractor is to manage and price for everything, apart from what would be unreasonable to allow for – the genuinely unexpected. If the event, and the extent of its impact, was reasonable to expect, then the contractor is not entitled to compensation. However, to the extent that such things are objectively not foreseeable, then the contractor is paid its direct costs, overheads, profit and delay costs and is granted an extension of time. While there will be some fighting in the trenches over what is unforeseen, ground conditions are effectively “at the employer’s risk”.

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<sup>8</sup> See clause 1.1.6.8 of the Red Book.

<sup>9</sup> I make no distinction between *unforeseeable* and *unforeseen* in this discussion as the issue is not whether or not any party actually foresaw the risk, or could have foreseen it, but whether or not it was reasonable to foresee the risk as a likely event. In this respect, the NEC3 formulation is a more accurate expression of the intent of the parties.

There are a number of difficulties with this policy:

- (a) concerns about liability for misleading data or faulty interpretation of it has led to a reluctance on the part of many employers to carry out thorough investigations, preferring to leave it to the contractors to carry out such investigations as they consider necessary;
- (b) while opportunities may be given by employers for contractors to undertake geotechnical and other investigations during the tender phase, these are effectively controlled by the employer, who may be disinclined to incur the cost and delay of carrying out additional tests, or to accept responsibility for the accuracy of such tests. At best, many contractors will carry out a visual surface inspection, and will leave it at that;
- (c) there is no clear obligation or incentive on the employer to carry out extensive investigations prior to tender. While in New Zealand we have relatively good protection from misrepresentation under the Contractual Remedies Act 1979 which would extend to omissions, there is no generally recognised duty of disclosure<sup>10</sup>, and the concept of an overriding obligation to act in good faith in a contract is an open issue<sup>11</sup>;
- (d) the lack of clear definition of what the contractor ought to have foreseen has led to major and costly disputes, particularly in relation to tunnelling; and
- (e) there is no clear incentive on the contractor to minimise the effect of adverse ground conditions; quite the reverse. The ability to recover all costs, be granted an extension of time and be paid day rates for delay and profit on such costs encourages inefficiency. I am sure many of us have acted for contractors in the past where finding undisclosed services or encountering a ground failure has turned a loss making job into a very profitable one!

While the standard approach seems to chart a reasonable middle ground for contracts with minimal ground condition risk, for projects with significant ground condition elements the clause is neither workable nor efficient as drafted.<sup>12</sup> The employer typically has little or no expertise in contracting, let alone the complexities of ground conditions. The contractor will have some expertise, and should certainly be able to identify the uncertainties if nothing more.

The fundamental flaw with the standard approach is that it glosses over a complex issue without genuinely playing to the parties' strengths.

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<sup>10</sup> See US case of *Morrison-Knudsen v State of Alaska* (1974) 519 P.2d 834 and in Canada *The Canadian Red Cross Society v WN Developments (Ottawa) Ltd and McLean & McPhadyen* Ontario Superior Court (1983) 1-CLD-02-09.

<sup>11</sup> See the discussion of the justiciability of good faith by Tipping J in *Wellington City Council v Body Corporate 51702 (Wellington)* [2002] 3 NZLR 486. This must also be read in the context of the implied obligations to co-operate and not to prevent completion, discussed in Keating on Construction Contracts, 8<sup>th</sup> Ed at paras 3-052 to 3-055.

<sup>12</sup> For a fuller discussion of this point, see Keating at para 20-069 et seq.

### 3. Duty of Disclosure

In most published standard forms, the unforeseen physical conditions clause is accompanied by a recognition that site investigation information will be provided by the employer, if not the interpretation of it<sup>13</sup>. NZS3910:2003 goes further by providing:

*The Principal warrants that it has made available to the Contractor before the submission of the Contractor's tender all information of which it is aware, which has been obtained by or on behalf of the Principal or Engineer for the purposes of the contract, on the nature of the physical conditions relevant to the Contract Works. The Principal makes no warranty as to the sufficiency or accuracy of such information. The Contractor shall be responsible for the interpretation of all such information for the purposes of the Contract Works.*

This clause appears to try to have it both ways by dealing with the lack of a common law duty to disclose, but trying to avoid any liability for misrepresentation. It fails on both counts. While it contains a warranty that the employer has provided all the information it has, it provides no incentive for the employer to carry out sufficient investigations to identify any risks particularly relevant to the project. Further, the express disclaimer on sufficiency or accuracy provides an illusion of protection against misrepresentation.<sup>14</sup>

Most standard forms also include a sufficiency of tender clause along the following lines, and have done since the nineteenth century<sup>15</sup>:

*The Contractor shall be deemed to have:*

- (a) based his tender on his own inspection and examination of the Site and on all information whether obtained by him or made available by the Employer; and*
- (b) satisfied himself before submitting his tender as to the correctness and sufficiency of the rates and prices submitted by him ...*

So while the standard forms encourage disclosure, it is on a measured basis. The employer is encouraged to disclose all relevant information, which is eminently reasonable. But at the same time, employers seek to avoid responsibility for the information, and provides no interpretation of it. This seems to be a very fine distinction to draw. Ultimately, if the information proves to be incorrect or inaccurate, the issue of foreseeability will probably resolve the matter, unless of course an optimistic employer seeks to argue that an experienced contractor should have known that the information was wrong!

The prevalent use of the standard clauses, and the relative uncertainty of the disputes processes, has given rise to a reluctance by employers to carry out thorough site and geotechnical investigations. This is perhaps exacerbated by a lingering concern that if the employer provides information and it is incomplete, wrong or misleading, then the employer will be liable, and the contractor's pre-contractual assessment of what may or may not be foreseen will be prejudiced. When the contractor frequently has the most expertise, such

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<sup>13</sup> See clause 5.1.6 of NZS3910:2003.

<sup>14</sup> See discussion of section 4 of the Contractual Remedies Act below.

<sup>15</sup> clauses 11 of the ICE, 4.11 of FIDIC Red Book and 60.2 of NEC3. NZS3910:2003 and SCC1 do not have similar clauses, though the obligation is implicit.

concern is understandable. For the reasons outlined above, the standard clause fails miserably to capitalise on this expertise.

#### *US Position*

The obligation to disclose is different in the US. The case of *Morrison-Knudsen Co v State of Alaska*<sup>16</sup> provides a helpful illustration, and tells a strikingly familiar tale.

The State of Alaska appointed the firm of Morrison-Knudsen to carry out runway extensions at the Sitka Airport. Prior to award, the State had carried out site investigations, including as to whether or not seabed material taken from “borrow pits” would be appropriate. Those investigations concluded that the material was “apparently dredgable”, and they were made available to bidders.

While some site investigation information about “borrow pits” was provided, it was disclaimed and bidders were to carry out their own site investigations and the contractor was to select its dredging equipment and could chose an alternative source of material.

Morrison-Knudsen’s bid manager reviewed the documents and viewed the site from the shore, but did not go over the borrow pits in a boat or take any samples or make any detailed survey. Based on his inspection and the material provided by the State, Morrison-Knudsen bid on the basis of hydraulic dredging of the material, which at that time was cheaper than the alternative methods, but reasonably sensitive, requiring relatively uniform material to dredge, little if any wind and a calm sea state.

The other bidders carried out more extensive investigations, including going out in a boat to examine the presence and size of boulders and generally assess the suitability of the material. They came to the conclusion that hydraulic dredging would not be appropriate, and one bidder declined to bid based on the lack of certainty of cost effective fill material. This view was communicated to the State.

In the event, all bids were outside the budget allowance. Morrison-Knudsen, as low bidder, sought an opportunity to negotiate. During those negotiations, there was evidence that a State representative asked Morrison-Knudsen if they would claim if the borrow pits were not as represented. Ultimately, a contract was concluded with Morrison-Knudsen, with the State not having shared the views of the other bidders that the statements in the site investigations, that material was suitable for dredging, were wrong.

It is apparent that the State went ahead with the contract with Morrison-Knudsen, knowing that their methodology for recovering the fill material may have been inappropriate, and in reliance on their disclaimers of the investigation information. Presumably this was for price reasons. Ultimately, Morrison-Knudsen had to source their materials from a considerable distance away, and lodged a claim for the additional cost of acquiring the material against the State.

Morrison-Knudsen argued that the State led it to believe that hydraulic dredging was feasible when it had information proving that it was not. Further, the state did not dissuade Morrison-Knudsen when it became apparent that they would use hydraulic dredging. The

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<sup>16</sup> (1974) 519 P2d 834

State denied making any representations, and argued in the alternative that Morrison-Knudsen did not rely on the representations.

The majority of the Supreme Court of Alaska considered the extent to which the State had a duty to disclose. Accepting that such a duty existed, citing with approval earlier dictum:

*It is well settled ... that where the Government possesses special knowledge, not shared by the contractor, which is vital to the performance of the contract, the Government has an affirmative duty to disclose such knowledge*

the majority found that the State did not possess such special knowledge. In the court's view, the State did not hold the information from a favoured position. It simply knew what two other bidders had discovered, and what Morrison-Knudsen could have discovered, if it had exercised more diligence in its pre-tender investigations.

The facts are interesting from a New Zealand law perspective. Even though this case was decided in the early 1960s, similar issues arise all too frequently today with many of us erring on the side of caution and either not releasing such information, or seeking warranties from those conducting the investigations and endeavouring to limit or exclude liability for errors in such information.

#### *Liability for pre-contract information*

Typical in most invitations to tender are statements to the effect that "*Tenderers are to rely on their own investigations*", or that site investigation information is "*provided for assistance only, and without liability to the employer*". These statements are usually accompanied by contractual terms which provide that the contract documents, as defined, comprise the entire agreement, and that the contractor agrees that it has not relied on any pre-contractual statements or representations by the employer.

#### *Misrepresentation*

The law in New Zealand on pre-contractual misrepresentation is governed by the Contractual Remedies Act 1979. There are two aspects of the Act which are of interest to us.

First is the ability in contract to deny the existence of any pre-contractual misrepresentations. In broad terms, section 4(1) of the Contractual Remedies Act reserves to the court the ability to determine whether a statement was made, whether it was a representation or term of the contract, and whether or not it was relied on. So in general terms, the Act makes such statements ineffectual. Why, then, do we continue to use them?

In reaching a conclusion to the three questions in section 4(1), the court will have regard to all the circumstances of the case in order to determine if the party relying on the exclusion has discharged its evidential burden that it is fair and reasonable for the exclusion clause to be conclusive<sup>17</sup>. Only once the court has determined that the exclusion clause cannot be relied upon can the questions of the nature of any statements, and the extent of reliance arise. In many circumstances, the employer may discharge its "*persuasive burden*", and

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<sup>17</sup> See *Ellmers v Brown* (1990) 1 NZConvC 190,568.

the exclusion clause will stand, and if it doesn't, the statements may still be relevant to the issue of reliance.

The second issue arising under the Contractual Remedies Act is where such statements, whether in the invitation to tender documents or in the contract itself, purport to limit or exclude liability for the employer. These clauses take the following form:

*To the extent that a court of competent jurisdiction finds that such statements were made, they were wrong and the contractor relied upon them, any damages flowing from such a findings, whether in contract, tort or otherwise, shall not exceed \$1.00.*

While this may seem to deny the operation of section 4, such clauses do fall squarely within the scope of section 5 of the Act, which allows the parties to agree the remedies available for breach. So it is one thing to deny the existence of pre-contractual misrepresentations and quite another to fix any damages for such misrepresentation to nominal amounts.

So, returning to our US example, from a New Zealand law perspective the ability of the State of Alaska to rely on the exclusionary statements will be dependent on the State discharging its persuasive burden that it is fair and reasonable for the exclusion to be conclusive of the relationship between the parties. That is a considerably different question from that posed by the State Supreme Court.

In lieu of a limitation of liability provision, the court would then consider the range of remedies available to it under sections 6 to 10 of the Act. In all probability, the remedy would be to follow the contractual entitlements to payment of cost, overhead, profit and the allowance of time; or in terms of NZS3910, to grant a variation. This, to me, is the context in which all such pre-contractual information and exclusions must be considered.

When providing geotechnical, site or other background information, is the employer seeking to provide flesh to clothe the bones of foreseeability in terms of clause 9.5? in which case there is little point in trying to exclude the information, or is the employer trying to provide as much information as it can to get a good price? while reserving its position to argue later that the contractor should have foreseen something else.

In that context, the concern about liability for the provision of such information is misguided. Further, good contracting practice requires the parties to fully consider the background information, to ensure that there is a full exchange of information and to agree what the contract should contain in that context. That does not mean, however, that these clauses should not be concluded.

Where two parties of similar competence and bargaining power have reviewed and agreed a contract, and have defined the relevant background information and reference condition, such clauses considerably reduce the risk of disruption and delay to projects, and also the risk of claim. They are not included out of an overblown concern for liability for error, but to reduce the risk of being blind-sided by the inclusion of largely irrelevant information produced and half considered during negotiation.

#### *Negligent Misstatement*

There is a parallel issue of liability in tort for negligent misstatement (principally on the part of the consultant undertaking the geotechnical investigation).

In order to establish liability for negligent misstatement, not only must the statement or advice be given by a person of professional expertise to a known recipient for a specific purpose (communicated to the maker of the statement), but the recipient must rely on the statement and act to its detriment. Where the claimant is a third party, who did not commission the original advice, the extension of the duty of care has been more restrictive than is often the case in negligence cases<sup>18</sup>. Factors to be taken into account will be, the terms of appointment and the extent of the consultant's responsibility, the relationship with the third party, the size of the class to which the third party belongs, the awareness of the maker of the statement of the reliance by the third party, and the extent of that reliance.<sup>19</sup>

This is, however, a separate and complex topic of discussion in itself.

#### 4. **Alternatives to the Standard Approach**

There are a number of alternatives to the standard approach. No option is universally correct, and each may be entirely suitable in the appropriate circumstances. The converse is also true!

(1) *Client takes entire risk*

This serves more to round out the full spectrum of possibilities, than to provide a sensible option for major projects. Under this arrangement, the contractor is paid the actual cost of completing the work, plus agreed margins and overheads, regardless of the ultimate cost. I have seen this approach used only where there was a strong construction market, the risk was relatively minor and the employer was unable to achieve the allocation in the standard forms.

The difficulty with this arrangement is that, much like the standard clause, it provides no incentive to the contractor to use its skills or knowledge to resolve problems with ground conditions cost effectively when they arise.

(2) *Define the reference condition*

This is a modification of the approach reflected in clause 9.5, paraphrased above.

This is an approach which is common in tunnelling contracts (see below). By defining the reference of baseline condition, the uncertainty of foreseeability is reduced, leaving only the issue of whether or not there is actually a departure from the reference condition, and whether or not it is significant.

Sadly, the difficulty with foreseeability is not removed entirely. In a geothermal project I advised on some years ago, the reference conditions defined such wonderful things as moisture content, ph, grit content, temperature, pressure and enthalpy (a word which is beyond even my copy of the Shorter Oxford Dictionary). Like all attempts to define the natural condition, it was a fine attempt at crystal ball

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<sup>18</sup> Though it is suggested that the leaky homes litigation has reversed this trend – see Anne Darroch & Susan Watson *The Liability of Architects in New Zealand* (2004) 10 NZBLQ 258.

<sup>19</sup> See the line of cases starting with *Hedley Byrne v Heller & Partners* [1964] A.C. 464, HL, as modified by *Henderson v Merrett Syndicates Ltd* [1995] 2 A.C. 145, HL, cited with approval in New Zealand in *Frost & Sutcliffe v Tuiara* (2003) 10 TCLR 912. In the *Frost* case, see also the interesting comments by Tipping J on the interrelationship between liability in tort and in contract, and the similarity of the tests in tort and contract in such circumstances.

gazing, but it inevitably came up short. When the bore produced such levels of pumice grit that it scoured the steam and geothermal fluid separator, I was left trying to interpret two lines of technical data to establish what might or might not reasonably have been foreseen!

Ultimately we do our best, but there is a limit to what uncertainties can be defined and people really cannot complain if contracts get thicker and thicker!

(3) *Painshare/Gainshare*

This is an example of contracts trying to get thinner! Used variously in alliance, collaborative working arrangements and partnering contracts, and in NEC 3 with the target contract options, painshare/gainshare contracts acknowledge that you cannot achieve total certainty, so they set up an alternative framework for dealing with uncertainty.

Under these arrangements, the contractor's margin for the entire project based on the budget is typically assured, the actual cost of construction is paid on an open book basis and savings from target cost is shared between the parties. While there is reference to painshare, most of the forms I have reviewed have allocated the lions share of the pain to the employer (who continues to pay), while the contractor's pain is more in the nature of profit foregone. This is not really the same thing.

Experiences with this type of contracting have been mixed. While proponents cite examples of considerable savings in time and money, and vastly improved relationships between the parties, other projects do cause some pause for thought. The difficulty with the success stories is that no party to a completed project really wants to talk about overruns, and pre-contractual expectations are frequently redefined after the event. It is rather hard to benchmark the success stories, and horror stories are not that hard to come by.

Where there are appropriate project uncertainties, such arrangements may be entirely suitable, provided the extent of the uncertainty is properly defined. However, an arrangement where the contractor's margin is guaranteed, but overall project outturn costs are not, is understandably viewed by many as being slanted in the contractor's favour.

(4) *Contractor takes all ground condition risk*

When discussing the allocation of risk for the Tsing Ma Bridge and the Site Preparation contracts, the two largest airport core projects for Hong Kong's new airport at Chek Lap Kok, we were somewhat surprised when the Government instructed us that the risk of unforeseen ground condition was to rest with the contractors.

The following clause was included in the HK Government's General Conditions of Contract for Airport Core Programme projects, in substitution for a clause very similar to clause 12 if the ICE 5<sup>th</sup> Edition:

*... the Contractor shall be deemed prior to submitting the Tender to have ... inspected and examined the Site ... satisfied itself as to the nature of the ground and subsoil ... No claim by the Contractor for additional payment or*

*any extension of time shall be allowed on the ground of misunderstanding or misapprehension of [these] matters ...*

There was understandable concern from the contracting community.

In the case of the Site Preparation contract, the HK Government relented slightly and provided raw bore hole information to tenderers, with no interpretation, and all the geotechnical information was heavily disclaimed. While HK did not have an equivalent provision to section 4 of the Contractual Remedies Act, there was a very real concern that an arbitrator might make a sympathy award. To counter this risk, tenderers were required to complete two sets of tender documents:

- (a) one reasonably detailed set with pricing schedules, complete with quantities, which were used for detailed tender evaluation and for dealing with claims, and
- (b) a second set to be included in the contract, with no reference to quantities. This was a relatively simple payment document.

There are two particular difficulties with this approach, in my view:

- (i) the allocation of risk was less a reflection that the parties had carried out thorough investigations and were comfortable with what they might encounter (and could price for it accordingly), than a reflection of the overriding desire of the Government to have fixed prices and certain completion dates, and the financial weakness of the international contracting community at that time, and
- (ii) the bidders were unable to price for the risk with any certainty. For the contractors, this meant that any contingency would be guesswork and would be compared with other bidders, in an environment where they were keen for the work. For the Government, while they could bring downward pressure on such contingency, the price of such certainty could be high. The contingency would be wasted if the risk did not eventuate, and if it did, there would be no certainty that the contingency would be enough, resulting in costs to the project elsewhere (even if simply in legal fees).

This gives a gloss on the truism about allocation of risk, that a project which goes off the rails benefits no one. If your project is going to be late, rights in contract aren't necessarily going to help; much like Neville Chamberlain returning from Munich in 1938, there is little practical benefit in holding a piece of paper<sup>20</sup>. Once a project has become a loss maker, most contractors will understandably look for ways to reduce that loss, rather than complete the project as well as the employer might have hoped. A right to sue won't necessarily help.

There are, however, situations where such an allocation of risk may well be appropriate. Where there is considerable, high quality geotechnical information available, the contractor has the skill and the resources to deal with what they might

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<sup>20</sup> On returning from Munich in September 1938, where he had reached agreement with Adolf Hitler following the annexation of the Sudetenland, Chamberlain declared "Peace for our time". The world's most unfortunate politician was subsequently lampooned by Monty Python, among others with a caption "I hold in my hand a piece of paper" to the picture of him emerging from the aeroplane.

find and all parties are comfortable with what will actually be encountered, this can be very effective.

## 5. Tunnelling Projects

No form of construction work operates so thoroughly in the realms of unforeseen physical conditions as tunnelling work. Regardless of the extent of the pre-contractual geotechnical investigations undertaken by either the contractor or the employer, the work is undertaken in the unknown. This is reflected in the claims history for such projects, and the reluctance of the insurance industry to provide cover for such work.

### *Code of Practice for Risk Management of Tunnel Works*

These concerns were addressed jointly in the UK by the British Tunnelling Society and the Association of British Insurers in *The Joint Code of Practice for Risk Management of Tunnel Works in the UK*, published in September 2003<sup>21</sup>. While not compulsory, the Code of Practice represented an acceptable middle ground for contractors and insurers for tunnelling works. It should be added that compliance with the Code of Practice does not assure that contractors will tender for major tunnelling projects, or that insurers will accept cover. Failure or refusal to follow the Code of Practice or at least to address the concerns which it covers will almost certainly make life more difficult for all but the most confident and competent of employers, willing to self insure.

The Code of Practice covers the entire project cycle from project development, design, procurement through to construction phases. It does not deal with operational issues.

The key elements of the Code are:

- (a) Increased involvement of the insurer, including the ability to attend on site and to require a rectification programme where non-conformances are identified;
- (b) Hazard identification (as low as reasonably practicable) and risk management through an agreed risk register for the project;
- (c) Ensuring that the employer engages appropriate technical skill;
- (d) Carrying out appropriate site and ground investigations, for the type of ground and the scope of work, sufficient for realistic and reliable assessments to be made of tunnelling methodologies and project viability;
- (e) The use of relevant standards, and the adoption of clear contract language;
- (f) The use of ground reference conditions (prepared by either the employer or the contractor);
- (g) Design checking for constructability;
- (h) The provision of contractor's risk registers, construction method statements, project risk management plans, staff and organisation plans and health and safety plans; and

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<sup>21</sup> An international version of the Code of Practice was published by The International Tunnelling Insurance Group in January 2006, with a more internationally balanced approach to risk and compliance.

- (i) Monitoring of progress, change management and value engineering.

In the main, the International Code of Practice provides a best practice guide for any contracting, and it is significantly less prescriptive than the British version.

#### *Geotechnical Baseline Report*

As mentioned above, a key element in tunnelling works, which is also critical to any contract which has significant element of unquantifiable physical conditions, whether it is shear strength, levels of water saturation, heat, steam pressure or chemical composition, is establishing the geotechnical baseline report.

The relevance of the geotechnical baseline report is to establish the reference condition; the point at which the contractor becomes entitled to additional payment and time (if relevant). It does not particularly matter if the geotechnical baseline report is right, or if the contractor has actually priced for the geotechnical baseline report or more or less favourable conditions – it is the assumed condition, and it sets the point at which further entitlements are established.<sup>22</sup> Once defined, the geotechnical baseline report and the specification for the project need to be carefully reviewed against each other, and the conditions of contract revised accordingly.

It will also be critical that the contractor has drafted the tender in reliance on the geotechnical baseline report and that any departure from the geotechnical baseline report actually caused additional cost or delay.

#### *Design and Specification of Construction Methodology*

Whether an employer's design or a design and construct approach is preferred, writing a performance specification and then relying on contractual rights will generally not result in a successful project, let alone an insurable one<sup>23</sup>.

It is almost inevitable that a designer will have to give real consideration to the contractor's methodology when preparing the design. These two issues are inseparable. For example, when setting the vertical alignment of a tunnel, there is little point in running the tunnel through variable or even unstable ground likely to result in considerable ingress of water and over break if the contractor is going to use a road header. Similarly, an earth pressure balance tunnel boring machine with a cutter head suitable for hard material is unlikely to be appropriate for soft clay material, unless the TBM head allows for such a change.

Most designers will therefore specify the performance requirements of contractor's equipment appropriate for the design (with provision for changing cutter heads, changing from open to closed modes, pressuring the cutter bulkhead with compressed air or probing forward, albeit obliquely, to assess the ground condition ahead). Care must be taken in such prescriptive contract provisions to ensure that the expertise, rather than prejudices, of the parties is maximised and that liability for such decisions rests where it should.

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<sup>22</sup> For more information on drafting ground reference conditions, see the ASCE publication *Geotechnical Baseline Reports of Underground Construction* (the Yellow Book).

<sup>23</sup> The Neville Chamberlain scenario referred to in footnote 20 above.

### *Dispute Resolution*

It is fair to say that on large projects there is growing dissatisfaction with lengthy, expensive and uncertain dispute resolution processes.

In the US, there is a strong preference for the use of dispute resolution boards to the point where many contractors will not bid for projects if DRBs are not used. This is also reflected in FIDIC's MDB form of construction contract, which has provision for compulsory DRBs. I understand that DRBs are also a core requirement for World Bank funded projects. In London, the Olympic Development Agency is requiring Disputes Avoidance Boards in all Olympic development projects, which is further advance on DRB's.

Whichever approach is adopted, the traditional Engineer determination, followed by mediation and arbitration is unlikely to be attractive to international tunnelling contractors, banks or insurers.<sup>24</sup> One analysis of the HK airport programme attributed its success to compulsory mediation, and the avoidance of formal arbitration.<sup>25</sup>

For many, mediation as a process is too full of uncertainty and the air of compromise hangs too heavy in the air. The common element in litigation/arbitration free projects is a swift and workable dispute resolution process which is truly impartial and independent. Even if the resolution is interim, if it is workable it will usually also be final, as a matter of practice, as can be seen by the success of adjudication under the Construction Contracts Act.

## **6. Management Post Award**

I am mindful that there are others who will wish to make a contribution to this topic, and they are better qualified to discuss the consequences of allocation of risk, and the management of such events.

From a drafting perspective, critical issues will ultimately be defining what could have been foreseen, having plans and method statements in place which reduce the risk of the most likely events, establishing what was actually encountered and managing or mitigating the effects of such events. This is not as easy as it sounds.

In tunnelling contracts, it may well be that your sole measure of ground condition is the progress of your tunnel boring machine and analysis of the material coming off the head. That material will be conditioned by additives for ease of handling, and once it is being conveyed away from the TBM, may well provide limited information about its strength and composition at the cutter face. Conversely, the operation of the machine and selection of excavation tools may have a greater effect on the progress of the machine than the ground condition. While, traditionally, the selection of contractor's equipment is in the contractor's

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<sup>24</sup> A recent alternative to DRB's is Project Mediation, which was developed by the Centre for Effective Dispute Resolution ([CEDR](#)).

<sup>25</sup> Of the 154 disputes lodged on the 93 major Government projects were resolved after the engineers discussion, 62 were resolved in mediation, 8 in adjudication, only 11 in arbitration, with the balance still to be resolved. For the MTRC's 31 major projects, no dispute made it to mediation or arbitration, and for the Airport Authority's 58 major projects, 10 formal disputes were raised, of which only 2 went to arbitration. See Dean Lewis *Dispute Resolution in the New Hong Kong International Airport Core Programme Projects – Postscript* [2002] ICLR 68.

realm of expertise, it may well be the natural consequence of the employer's design, or any restraints of alignment, both vertically and horizontally.

The critical management issue, however, is that the competent party should manage the risk, there should be a full contemporaneous collection of detailed records and the contract should incentivise the parties to mitigate the effects.

## 7. Conclusion

A successful project is one where both parties make money, rather than one party driving another to the wall.

While risk should certainly be allocated to the party best able to manage it, that allocation will vary from project to project, and party to party. If there are approaches that can be applied to all projects, which will assist:

- (a) Carry out as thorough ground investigation as time, money and resources allow,
- (b) Take the time to understand and become comfortable with each other's position,
- (c) Have a clear contract (this does not mean plain or short, or containing a myriad of "*for the avoidance of doubt*" provisions; it means clear),
- (d) Actively manage the risk, don't just rely on contractual responsibility, and
- (e) Have a dispute resolution process which the parties can have faith in, and which promotes resolution, rather than entrenching parties' positions (though it may appear so to you or your client, very few people go into litigation or arbitration knowing they are wrong). Make the process prompt and roughly right – the finer points of natural justice matter little to most parties, particularly if they have to pay for them to be debated.<sup>26</sup>

One size does not fit all, and risk varies from project to project. Successful projects identify those risks, and what to do if they eventuate. They also encourage the parties to establish a level of trust that enables them to deal with the unexpected in a way which is appropriate – it is not possible to legislate for trust, but poor drafting can inhibit its development.

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<sup>26</sup> My thanks to Carol Durbin for this pithy comment.