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

1. Introduction

In the construction industry, we hear many adages like “project risk should be allocated to the party best able to manage it”. 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. 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.

The critical issue 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.

Uncertainty

For tunneling, the greatest uncertainty is the geotechnical condition to be encountered. Only once the ground condition is understood, and the uncertainties identified with as much clarity as possible, can the parties

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engage in a productive discussion about allocating responsibility for dealing with those risks. The quality of that discussion will depend on the information available and the skills the parties bring to the table.

Allocation

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 price for uncertainty in a competitive environment. This regrettably rewards aggressive or even reckless tendering, and can translate into more aggressive attitudes towards recovering costs during construction, or managing risk through the claims procedures. 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 project.

This is best 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 by the employer or the contractor. While this is accepted shorthand for whether or not the contractor will be entitled to be paid or given more time if a certain risk eventuates, it also creates a misleading assumption that the parties are in some way equal partners. They are not; they bring different skills and expectations to the table.

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. I’m sure we all hear too often the statement “it’s not my problem” from owner’s representatives. Sadly, this is not at all true; when an event occurs which is not properly managed, and may not have been priced for, it is every one’s problem. It may be principally one the contractor’s responsibility to deal with, but it is still a problem for the project.
The contractor is providing a service to the employer for payment. The issue of foreseeability 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.

**Habitual Allocation**

As creatures of habit, all involved in the construction industry are 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.

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.

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.
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.

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.\(^2\)

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.

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. 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.

A number of factors can be taken into account when assessing *foreseeability*:

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. 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.

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\(^2\) See *Thorn v London Corp* (1876) 1 App Cas 120.
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”.

There are a number of difficulties with this policy:

(a) concerns about liability for misleading data or faulty interpretation of it has lead 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. While this may seem rash, the contractor invariably has the best knowledge of his equipment, and what he can expect;

(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 extends to omissions, there is no generally recognised duty of disclosure;³

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³ 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, and the concept of an overriding obligation to act in good faith in a contract is an open issue (see the
(d) the lack of clear definition of what the contractor ought to have foreseen has lead 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.

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.\(^4\)

The employer frequently 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.

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.\(^5\)

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.

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\(^4\) For a fuller discussion of this point, see *Keating* at para 20-069 et seq

\(^5\) See clause 5.1.6 of NZS3910:2003
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.

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 know that the information was wrong!

US Position

The obligation to disclose is different in the US. The case of *Morrison-Knudsen Co v State of Alaska*\(^6\) 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 the 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.

\(^6\) (1974) 519 P2d 834
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. Not surprisingly, the proposed hydraulic recovery from the borrow pits failed and Morrison-Knudsen had to source their materials from a considerable distance away. They 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 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:

\begin{quote}
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.
\end{quote}

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.

From a New Zealand law perspective the ability of the State of Alaska to rely on the exclusionary statements would 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, in terms of section 4 of the Contractual Remedies Act 1979. 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.

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.

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.

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 an approach which is common in tunneling contracts (see below). By defining the reference or 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 recent geothermal project, 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 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, trying to interpret two lines of technical data to establish what might or might not reasonably have been foreseen was no easy task! I should add that on the interpretation of those two lines rested millions of dollars in claims.

(3) **Painshare/Gainshare**

Used variously in alliance, collaborative working arrangements and partnering agreements, 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.

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 contracts inevitably allocate 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.

Where there are appropriate project uncertainties, such arrangements may be entirely suitable, provided the uncertainty is significant and its extent 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

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 5th Edition:

… the Contractor shall be deemed prior to submitting the Tender to have … inspected and examined the Site … [and] 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 when the first contracts containing this clause were issued for tender.

There are two particular difficulties with this approach:

(i) the allocation of risk can be less a reflection that the parties have carried out thorough investigations and are comfortable with what they might encounter (and could price for it accordingly), than of the overriding desire by employers to have fixed prices and certain completion dates, and perhaps of unequal bargaining power; and

(ii) the bidders are unable to price for the risk with any certainty; any contingency would be guesswork. Ultimately, if the risk does not eventuate the contingency is wasted, 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 up a piece of paper. 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 any one other than the lawyers.

Conversely, where there is considerable, high quality geotechnical information available, the contractor has the skill and the resources to deal with what they might find and all parties are comfortable with what will actually be encountered, this can be a very effective allocation of risk.

5. Conclusion

A successful project is one where both parties make money, rather than one party driving another to the wall but forcing it to complete the project at a loss.

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.

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.