TRENCHLESS TECHNOLOGY PROCUREMENT STRATEGY

Blair Telfer, CP Eng, M.IPENZ
Mott MacDonald

ABSTRACT

There are a number of factors that should be considered when procuring the services of a construction contractor to ensure that the best value is obtained by the owner/principal. This is particularly true for projects utilising the more specialised forms of Trenchless Technology as there is a relatively small number of such contractors able to provide the desired service and they may be based a long way from the project.

While the general principles discussed in the paper can be applied to a wide range of projects it is particularly focused on the use of Trenchless Technology.

In broad terms the paper will address this challenge from two perspectives which are considered essential to driving value in the current market

1. Maximising Competition

The more open the tender documents are about the methodology to be used to achieve the desired outcome, the greater the number of contractors able to tender, and the more competitive tension there will be driving pricing.

2. Making the Project Attractive

There are many factors that will influence the attractiveness of the project compared to other opportunities that may be available to potential contractors. These factors inevitably also influence the tendered prices that are submitted. These factors include the nature of the project, how well defined it is, the opportunity for alternative approaches to be considered, the quality of the information available (particularly ground conditions), the time available for commencement and completion, whether it is a 'one-off' project or part of a multi-year / multi-site arrangement and perhaps most importantly, what risks there are and how those risks are shared between the owner/principal and the contractor.

In preparing the paper the author engaged with the leading Trenchless Technology contractors and the paper will illustrate their views of what makes tendered projects particularly attractive and unattractive to them. The paper will also highlight the most important of these considerations from the contractor's perspective.

Application of the principles presented in the paper should provide the owner/principal with a range of competitive tenders and avoid the situation of a limited, if any, response from the market and/or prices that include unnecessary loadings for risk or inconvenience. (Times New Roman, 11)

KEYWORDS

Trenchless Technology, Procurement, Risk sharing

1 INTRODUCTION

The use and acceptance of trenchless technologies for new and renewed pipeline assets is no longer the specialised alternate option. It is now regarded as a mainstream, if not the default option, in some of the larger urban cities in New Zealand. However, this is not the case in all towns and cities in NZ for all projects – why not??

In some cases, the answer is obvious; for instance, a small bore installation in an open rural greenfield area will likely be most cost effective and lowest risk if carried out by a traditional open trench method. Similarly, a new pipeline installation in a highly service congested area may also be least risk, albeit disruptive, if completed by an open trenched method. However, for the remainder of the pipeline renewals or new installs it may be that the best option, from a cost, disruption and risk perspective, is a trenchless method. The problem often is that the answer to this question is not known until the end of project. So what tools and techniques can be used to better answer this question earlier in the project lifecycle. Should the Client know what's best and decide themselves? Should it be on the professional service Designer to confirm, as part of their option analysis? Although both of these parties should have input into the decision making, ultimately, I believe, it is the market place itself which is best placed to decide or determine this.

2 OPEN DESIGN / OUTPUT OBJECTIVE SPECIFIED CONCEPT

This does not mean the contractor should have 'carte blanche' to undertake whatever they want and potentially deliver a low quality end product to the client. The client must confirm and set the desired final objective and any constraints. Examples of typical constraints would be start and finish points; pipe sizes and hydraulic requirements; and consent conditions. The Client should also confirm allowable tolerances and/or measures of success. Furthermore, the client should also confirm, as a constraint, the acceptable levels of disruption to service.

This method of confirming the output objective does not specifically dictate that a 'Design Build" procurement model has to be followed. It may be, but not by definition. There is still an amount of forward investigation works that need to be completed so that potential methods are able to be confirmed or not. Such investigations would include for ground conditions; underground utilities; surface features and existing pipe condition. Depending on the exact nature of the output, hydraulic modelling may also be required. Simplistically, sufficient investigations need to be undertaken to demonstrate proof of concept feasibility for both trenched and trenchless methodology options. The project risk matrix should confirm the level this investigation needs to be.

This may take a small paradigm mind shift for some designers from the traditional definitive design output, to merely designing an output objective. However, it may also offer some savings to the client as the investigations undertaken become quite specific/targeted for the proposed project methodology, as opposed to being general and having to do so much to cover all potential options/scenario's.

Some typical scenarios of how this output objective concept may work could be as follows:

2.1. SCENARIO 1

Wastewater overflows are occurring due to high I/I levels and insufficient capacity in the network. Through internal optioneering workshops the client has decided that the 'solution' is to divert flow out of the current catchment to an existing pump station, in an adjacent catchment. A new wastewater pipeline is therefore required to be constructed.

Photograph 1: Scenario 1 Outline picture

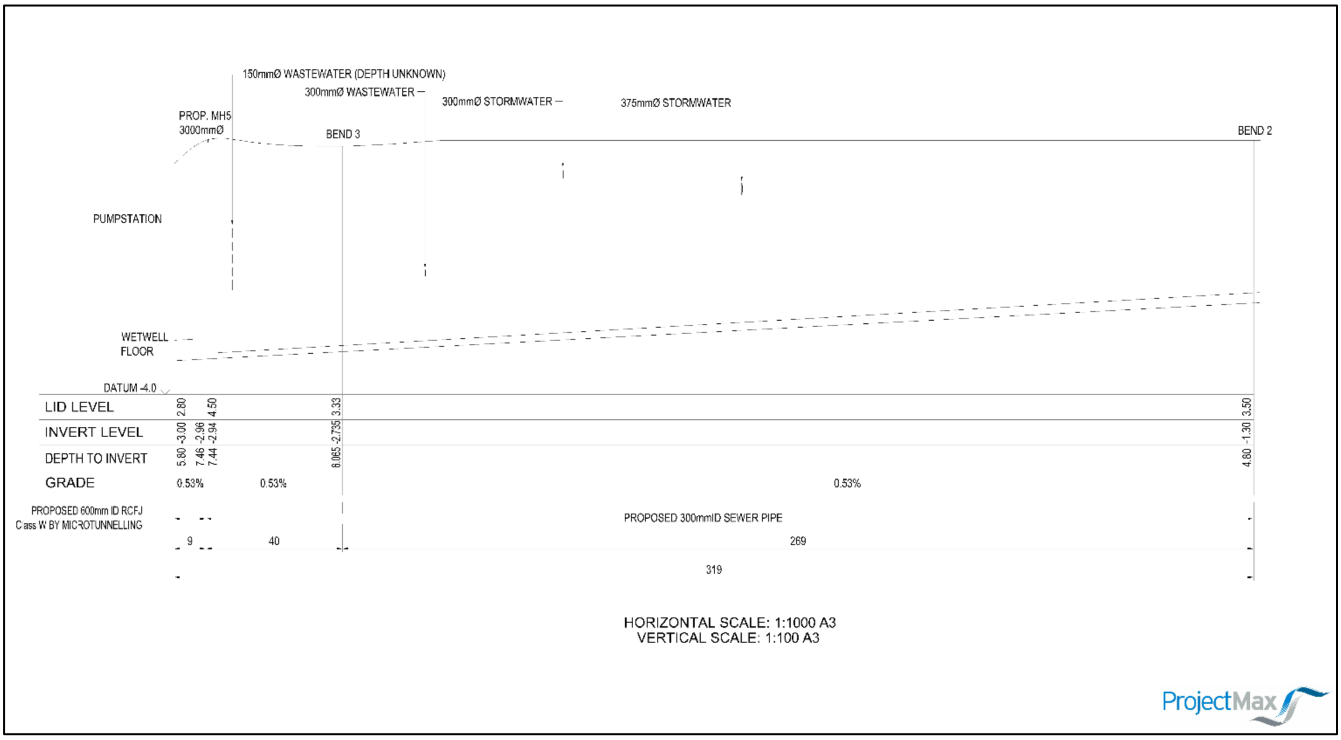

Figure 1: Scenario 1 Design Long Section Sheet 1 of 2

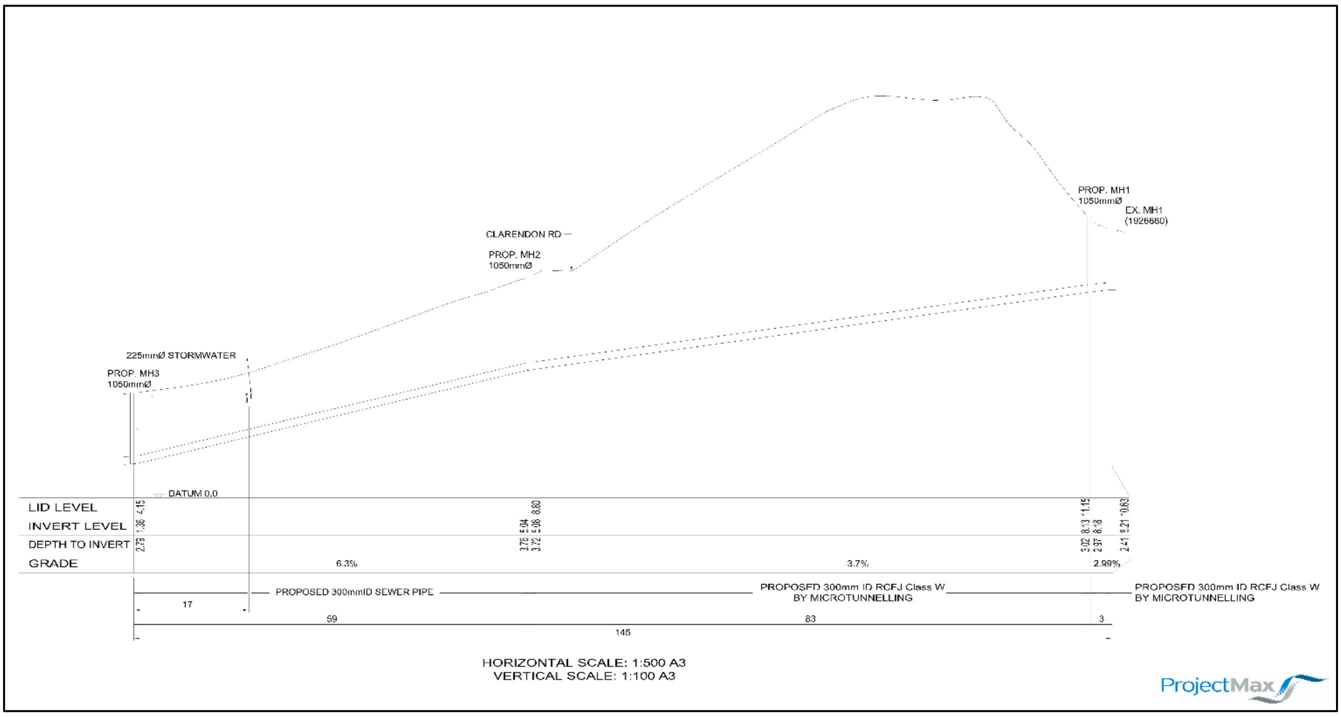

Figure 2: Scenario 1 Design Long Section Sheet 2 of 2

The client arranges for hydraulic modelling to confirm the volumes to be diverted and hence the appropriate minimum pipe size. Geotechnical investigations were also undertaken, through the design professional services. These geotechnical investigations focused on nature of the soil materials, found to be sand and marine muds, the position of the water table and the strengths of the various materials. A factual and interpretative report were prepared as well as a baseline report. This information was provided to all of the tenderers so they could determine what methods were feasible and what actions or mitigating steps they would need to undertake for any particular methodology they wished to use.

In this case a resource consent was also required. Here again the application for the consent was managed through the professional services designer. The consent conditions and necessary mitigation requirements were confirmed as part of the complete tender documentation package, so that again the potential tenderers were aware of what constraints they had to work under and meet. The consent conditions were not specific to a particular methodology, they also were output based i.e. maximum disruption/damage levels acceptable during and after the works.

Through the design phase two distinct work areas were identified as needing to have the pipe installed by trenchless methods. One was in a private property where the trench would have been over 10m deep and the other was across a reserve area with large protected tree's. These became project specific constraints that the Client required to be undertaken to manage the issue of disturbance.

The tender design therefore only had to identify the start and finish points, the pipe size and gradient and the two specific methodology constrained areas. The design and corresponding tender schedule, as will be described in more detail later, allowed the tender market place to determine the best methodology. It allowed tenderers to promote methods that suited their strengths and by definition gave the client the best value for money construction cost. All of the client requirement/expectations were noted and had to be allowed for in the prices offered.

2.2 SCENARIO 2

Two stormwater projects that were recently tendered for professional design services. In this case, although there were two different projects, the scenario is effectively the same. In Project #1 the brief called for a new 1500mm pipeline to be constructed and the upsizing replacement of an existing large diameter box culvert, approximately 175m in total. In Project #2 a 400m section of the existing reticulation was to be upsized one pipe size i.e. 300mm to 375mm, 525mm to 600mm.

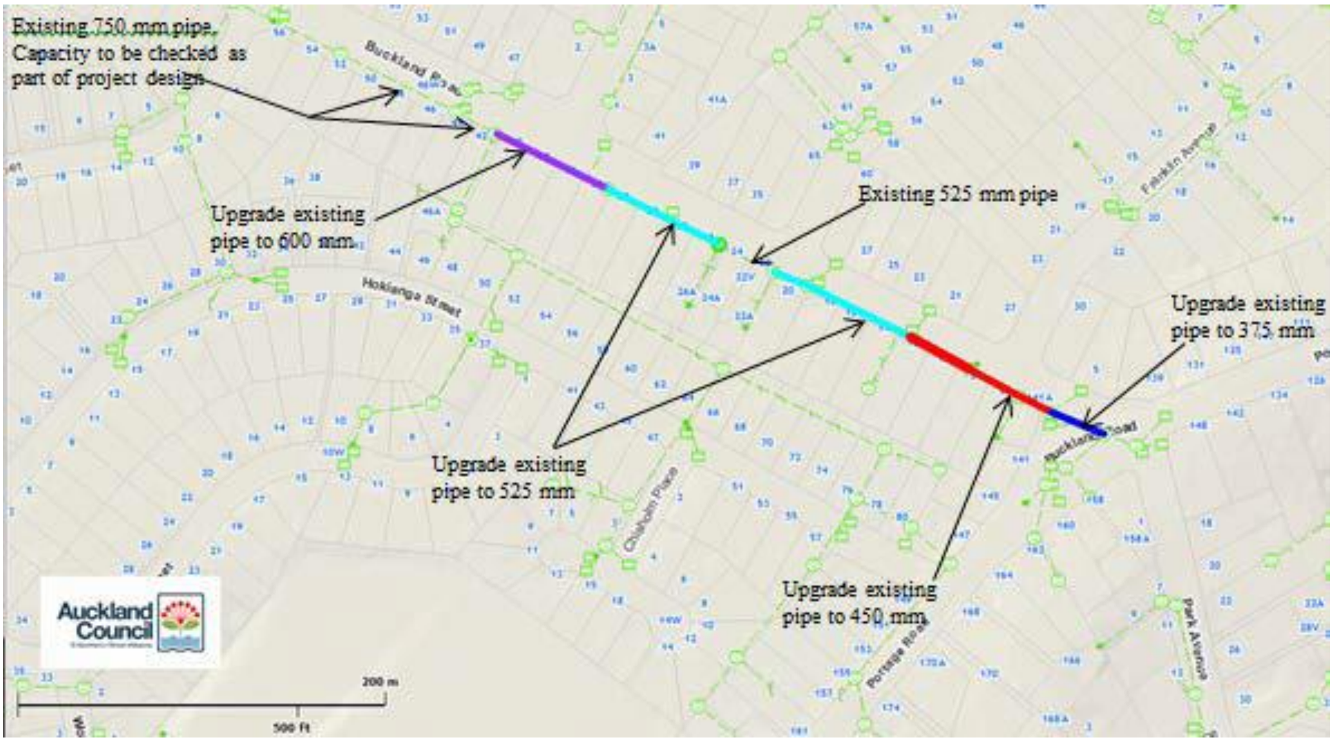

Figure 3: Scenario 2, Project #1 Outline Scope

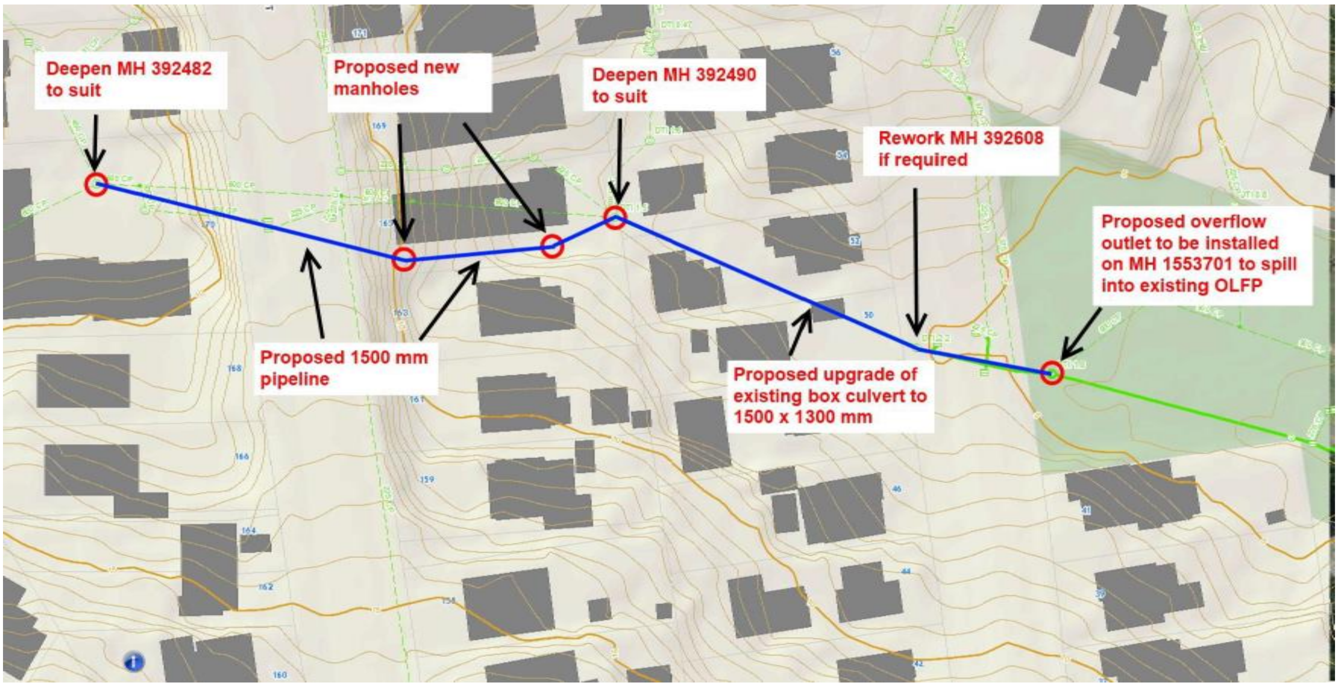

Figure 4: Scenario 2, Project #2 Outline Scope

In these cases, the risk is that a Client led design will 'lock in' a prescriptive methodology, likely to be open trench. The investigations will therefore also be tailored around this proposed methodology as would any consenting. This minimizes any potential innovation that a physical works tenderer may wish to offer. Any innovative physical works tender submitted is likely to be treated as an alternate and the tenderer may have to allow for further investigations potentially to confirm their proposed method is feasible.

At this stage of the project's asset creation the optimal method(s) are not able to be adequately determined. Potential solutions include a new pipeline by open cut methods on the same or different alignment, pipe bursting to upsize the host pipe, a new line installed by trenchless methods (HDD or micro tunnelling), rehabilitation of the existing line to use its current capacity and then a new pipeline for the additional volumes required. The new pipeline could then be installed by either open trench or trenchless methods. The option possibilities, at this time, are so many and varied, that requiring a designer to price the ONE option, determined by the Client, at the time of a professional services tender, with no supporting information, is not ideal.

It is quite unlikely that the designer will in fact come up with the most innovative design or methodology. Due to the design outputs typically requested by Clients, designs tend to be more conservative, lower risk than innovative.

Potentially a better solution would be to require an output tailored design brief. Defining the start and finish points and the pipe sizes and any other specific requirements that the Client may wish to stipulate but then specifically allowing for flexibility and innovation in how tenderers saw best to achieve the final outcome. A geotechnical survey would also be required so that tenderers understood what types of ground conditions they would encounter and therefore would allow for any methodology mitigation management. In these cases, with some minor additions, the brief for the design services could become the 'final' design for physical works tender.

An example of another Client constraint could be that they will, or will not, accept having two pipes in the reticulation i.e. bifurcation to achieve the required capacity. In this manner the Client is still 'in control' of the final output, as much as it wants to be.

As described in Section 2.1 methodology specific investigations would be carried out and allowed for by the physical works tenderer/contractor on an agreed risk share basis. Note the risk share could be 100% 'owned' by the contractor, if so desired.

3 COMPARE APPLES WITH APPLES FOR PHYSICAL WORKS PROCUREMENT

A perceived issue with procuring the works under such an open design/output targeted mechanism is how do you 'compare apples with apples' when you are faced with differing offered solutions. The answer is in ensuring that all of the required facets to meet the end objective are covered within the tender rate schedule(s). This includes not only for the physical works but must also include for any additional investigations that a particular method may require, any risk management/mitigation measures that the Client believes is appropriate, all ancillary works that a particular method may involve. Note these may be temporary works, shaft construction, by pass pumping, traffic control, existing utility management or otherwise necessary to undertake the works or permanent works, the likes of final surface re-instatement.

As not all of these are always required for every method, price allowance for such items can be either through including all likely requirements in the schedule and the tenderer only prices those that are applicable to their methodology or a tender may have 3 or 4 different schedules that a tenderer could price depending on their offered method(s). Two examples of each of these mechanisms are shown below.

3.1 ALL INCLUSIVE RATES

In *Tender Schedule 1*, which was used for the scenario #1 Project, the basis of payment for the pipe installation rate Item 2.2 included the following details to allow for the tendering of different methodologies

ITEM	DESCRIPTION	UNIT	QUANTITY
2.1	Pipe Supply		
	a) 300mm NB uPVC SN 16 or equivalent PE pipe	lin. m	705
	b) 300mm NB RCFJ Class W Jacking pipe	lin. m	85
	c) 600mm NB RCFJ Class W Jacking pipe	lin. m	10
2.2	Pipe Installation in Ground Strength 0 - 2 MPa		
	a) Ex MH1 to MH1	lin. m	3
	b) MH2 to MH3	lin. m	59
	c) MH3 to MH4	lin. m	305
	d) MH4 to MH5	lin. m	335
	e) Extra Over for Disposal of Contaminated Material - Provisional Sum	PS	1
	h) Extra Over for Excavation in Rock, (2Mpa - 5MPa) - Provisional Item. Refer Basis of Payment Item 14.2.7.	m3	5.00
2.3	Micro tunnelling Pipe laying in Ground Strength 0 - 2 MPa		
	a) MH1 to MH2	lin. m	85
	b) MH5 to Pump Station	lin. m	10
	h) Extra Over for Tunnelling in Rock, (2Mpa - 5MPa) - Provisional Item. Refer Basis of Payment Item 14.2.7.	lin. m	50.00

Table 1: Tender Schedule 1

Item	Method Allowance	
	Trenched	Trenchless
P14.2.2 Pipe Installation	• Excavation and saw cutting of hard surfaces • Protection of existing services • Dewatering • Trench support • Pipe laying including jointing, as necessary dependant on pipe type • Long radius swept bends, as shown on drawings • Bedding and cover. • Backfilling of all excavations according	• Establish drill machine and receiving pits including temporary or permanent works to support excavations • Protection of existing services • Dewatering and Removal of excess spoil • Pipe installation by micro tunnelling / guided boring • Re-instatement of drill and receiving pits

	to the Code of Practice for Working in the Road. • Hard Surface Material reinstatement, including joint sealing – Refer to Specification 1P.16.6 • Removal of excess spoil	
P14.2.7 Extra Over for Installation in Rock	• Saw-cutting of surface; • Excavation and disposal of material; • Backfilling with GAP 40 material; • Compaction to standards as specified in the Code of Practice for Working in the Road; and • Replacement of surfacing. Payment shall be per cubic metre of rock removed, solid measure and including for 25% overbreak	• Changing of drilling or tunnelling heads as required. Any retooling costs. • Additional reaming or tunnelling required in order to install pipe in rock. • Any additional operating costs and consumables associated with operating trenchless equipment in rock. • Disposal of any spoil material. • Reinstatement and replacement of any surfaces as required. Payment shall be per metre of pipe installed

Table 2: Tender Schedule 1 Basis of Payment

3.2 MULTIPLE TENDER SCHEDULES

In another example where a range of various methods were acceptable to a client to rehabilitate a section of large diameter sewer, three schedules covering each of the methods, spray coat, FRP section insertion and spiral wound PVC strip, were included in the tender. Each tenderer then just priced their applicable schedule. Here again it can be seen that the various identified risk elements are covered in the schedule for pricing. Allow for an equal cost comparison to be carried out.

ITEM	DESCRIPTION	UNIT	QUANTITY
2.0	Cleaning and Inspection of Sewer Lines (Specific Clause 2.0)		
2.1	84' Semi Elliptical	Lin m	500.00
2.2	Extra Over for excessive debris removal	Tonne	5.00
2.3	Extra Over for bacteria/algae cleaning with Hydrogen Peroxide	m^2	1050.00
3.0	Excavation for Plant & Equipment Access (Specific Clause 3.0)		
3.1	Excavate to sewer up to 5m deep	No	3.00
4.0	Structural Rehabilitation - (Specific Clause 4.0)		
4.1	D10 steel re-inforcement remediation	lin. m	100.00
4.2	D12 steel re-inforcement remediation	lin. m	100.00
4.3	D16 steel re-inforcement remediation	lin. m	100.00
4.4	Cementitious mortar	m3	105.00
5.0	Sewer Lining (Continuous lining, fully trenchless) (Specific Clause 5.0)		
5.1	84' Semi Elliptical	m^2	2100.00
6.0	Separate Establishment (Specific Clause 6.0)		
6.1	Separate Establishment	each	3.00
6.2	Provide equipment and personnel for pipeline entry by the Engineer / WSL.	hr	480.00
6.3	By Pass Pumping as required by Specific methodology		
6.3.1	(a) MH 30 to MH 29	LS	1.00
6.3.2	(b) MH 29 to MH 28	LS	1.00
6.3.3	(c) MH 28 to MH 27	LS	1.00
6.4	Tenderer to Specify		
	TOTAL CAC MORTAR LINING ITEMS		

ITEM	DESCRIPTION	UNIT	QUANTITY
2.0	Cleaning and Inspection of Sewer Lines (Specific Clause 2.0)		
2.1	84' Semi Elliptical	Lin m	500.00
2.2	Extra Over for excessive debris removal	Tonne	5.00
3.0	Excavation for Plant & Equipment Access (Specific Clause 3.0)		
3.1	Excavate to sewer up to 5m deep	No	3.00
4.0	Structural Rehabilitation - (Specific Clause 4.0)		
4.1	D10 steel re-inforcement remediation	lin. m	100.00
4.2	D12 steel re-inforcement remediation	lin. m	100.00
4.3	D16 steel re-inforcement remediation	lin. m	100.00
4.4	Cementitious mortar	m3	10.00
5.0	Sewer Lining (Continuous lining, fully trenchless) (Specific Clause 5.0)		
5.1	84' Semi Elliptical	Lin m	500.00
5.2	Grout Void Filler	m3	360.00
6.0	Separate Establishment (Specific Clause 6.0)		
6.1	Separate Establishment	each	3.00
6.2	Provide equipment and personnel for pipeline entry by the Engineer / WSL.	hr	125.00
6.3	By Pass Pumping as required by Specific methodology		
6.3.1	(a) MH 30 to MH 29	LS	1.00
6.3.2	(b) MH 29 to MH 28	LS	1.00
6.3.3	(c) MH 28 to MH 27	LS	1.00
6.4	Tenderer to Specify		
	TOTAL SPIRAL WOUND PVC STRIP LINING ITEMS		

ITEM	DESCRIPTION	UNIT	QUANTITY
2.0	Cleaning and Inspection of Sewer Lines (Specific Clause 2.0)		
2.1	84' Semi Elliptical	Lin m	500.00
2.2	Extra Over for excessive debris removal	Tonne	5.00
3.0	Excavation for Plant & Equipment Access (Specific Clause 3.0)		
3.1	Excavate to sewer up to 5m deep	No	3.00
4.0	Structural Rehabilitation - (Specific Clause 4.0)		
4.1	D10 steel re-inforcement remediation	lin. m	5.00
4.2	D12 steel re-inforcement remediation	lin. m	5.00
4.3	D16 steel re-inforcement remediation	lin. m	5.00
4.4	Cementitious mortar	m3	1.00
5.0	Sewer Lining (Continuous lining, fully trenchless) (Specific Clause 5.0)		
5.1	84' Semi Elliptical	Lin m	500.00
5.2	Grout Void Filler	m3	630.00
6.0	Separate Establishment (Specific Clause 6.0)		
6.1	Separate Establishment	each	3.00
6.2	Provide equipment and personnel for pipeline entry by the Engineer / WSL.	hr	125.00
6.3	By Pass Pumping as required by Specific methodology		
6.3.1	(a) MH 30 to MH 29	LS	1.00
6.3.2	(b) MH 29 to MH 28	LS	1.00
6.3.3	(c) MH 28 to MH 27	LS	1.00
6.4	Tenderer to Specify		
	TOTAL FRP SEGEMENT LINING ITEMS		

Table 3: Tender Schedule 2

By covering all of the various requirements, including risk mitigation, at whatever shared level of risk the client wishes, tender prices can be compared against one another i.e. “apples with apples”.

4 WHO SHOULD OWN THE RISK

4.1 RISK REGISTER

This leads to the issue of determination of what project risks exist, how they can be mitigated and who should ‘own or share’ the risk i.e. which party is best placed to deal with and manage the risk. This again is where the Client gets to confirm their expectations or levels of service in so much as the risk can be ‘what if a certain level of service is not attained”. This allows for the expected outcome(s) to be clearly identified and processes to ensure the final output meets its expected objectives or corrective actions that may require to be undertaken so that the final output objective expectation is met. Typically, the risk register would be started internally by the Client and needs to be developed from the start of project inception not at the start of the physical works as it is as much about project risk identification and management/mitigation as it is about the physical works.

This risk identification should be shared and reviewed by all applicable and appropriate parties at regular project milestones or stages/phases. The decisions/determinations from the risk register, in terms of mitigation actions, are then able to be translated through to both the professional service and physical works tenders, as applicable.

4.2 RISK MANAGEMENT AND MITIGATION

An example of a project risk that may be considered is a lack of competitors tenders. If this is likely and/or likely to have a high consequence, most likely in terms of either costs or timing, then steps needs to be taken to ensure the project is attractive to encourage a quorum number of tenderers to give a competitive tender submission. This risk can be shared by the professional service provider, again, as much as the Client, wishes to put the risk on them.

Another example of a construction risk could be unacceptable dipping of pipe in a gravity sewer situation. This could be a risk that is explicit to a Horizontal Directional Drill (HDD) methodology as opposed to an open trench method. In this case the risk mitigation will confirm what is an acceptable level of dipping and what corrective actions would need to be undertaken should an unacceptable dip occur. This means that the trenchless contractor can decide if they wish to accept this risk or not and if they do then build in to their price any costs they think are appropriate risk mitigation costs. This could be that they allow for small short ‘dig up’ sections in localised areas where there is a dip. Equally they may offer to share the risk with the Client. Either way all parties are/must be clear with whom is accepting what risk.

This is an example of the Client being able to (i) confirm what is acceptable, or not, to them, (ii) allocates the risk to the party best placed to manage it i.e. the driller and (iii) by the contractor making their own risk allowance in the tender price allows a potentially riskier trenchless HDD method to be compared to a less risky open trench method. But it should also allow or entice both (i) a trenchless option to be submitted, ensuring a competitive tender process and (ii) allows for the client to share in innovation, in a risk controlled manner.

4.3 RISK ASSESSMENT

A key element of this Risk assessment is understanding the various techniques, what is being offered and the risks associated with them. A professional engineer will help the Client in this regard by providing the level of knowledge and information required so that a balanced assessment can be undertaken. Critically here are two important aspects, best summed by well used phrases “knowing what you don’t know” and “the only dumb question is the one that wasn’t asked” and understanding that the contractor has their own ‘’agenda’ and some information they provide “should be taken with a grain of salt”. Failure or inadequate assessment of risks and the necessary management/mitigation steps is potentially likely to leave the Client being disappointed when the final outcome does not their expectations. This can be because either their expectations were always unobtainable and this is not realised due to a lack of information and understanding or the risks were not adequately ‘valued/costed/weighted’ resulting in an unbalanced assessment. Either way, the need for accurate information is paramount to this aspect of the risk assessment.

5 INTRINSIC VALUE AND COST

In terms of comparing or 'valuing' a trenchless option to a trenched option other items to be considered include what are often referred to as intrinsic value. These generally relate to disruption, cost of; environmental, greenhouse gases, social impacts, noise and nuisance. Historically these were given some value and credit in a qualitative sense but not with any quantifiable means. This made it difficult to include in a tender evaluation as a point of comparison i.e. 'comparing apples with apples'. There are now, however, on-line calculators for most of these events. NASTT and Vermeer, for instance, have their own carbon calculators that look not only at the Greenhouse Gases Emissions (GGE) at the works site but go so far as to calculate them for the whole of the supply chain for the products used e.g. the quarrying 'costs' for backfill material, plus the machinery to transport and place/compact it. Similar calculators are also now available for the 'cost' of traffic delays due to roadwork disruptions and the like.

'Whole of life' costs should also be considered in the overall project cost. Not just "todays" costs to install a new or renewed pipeline but also any costs associated with its on-going operation, new connections, maintenance, including accessibility and final disposal. Moreover, the latest Health and Safety at Work Act places a responsibility on both the Client and its associated upstream parties e.g. professional services designers, to make consideration for Health and Safety risks and costs. Here again, not just in the initial construction but throughout the entirety of the asset life, including final disposal.

All of which should be allowed for/factored into any design and construction option assessment analysis.

6. CLIENT PROCUREMENT CONSIDERATIONS

There are other procurement mechanisms that a Client can/should use to make any project attractive to the industry. The following considerations relate, in general, to all projects but are especially important in regard to the trenchless industry.

6.1 FLEXIBILITY AROUND METHODOLOGIES

As described previously above having an "open" output objective driven design will go a long way to meeting this consideration. The flexibility within the tender documentation to allow for alternate methodologies to be offered and compared equally. A trenchless method should not be seen as an alternate tender and evaluated as such. It should stand and be evaluated on the same basis and merit as a trenched option.

6.2 TIMING OF PROJECTS

Allowing flexibility for the construction marketplace in terms of when the works need to be undertaken or when they need to be completed by, will likely provide added dividends in terms of competitive tenders received. Note undertaken and completed timeframes are sometimes two quite different dates. Emergency situations requiring urgent attention are excluded, as these are different. For this exercise we are considering/focussing on the planned renewals/upgrades. It is understood that some renewals need to be undertaken and completed in a shorter timeframe, however if correct asset management processes and techniques are being followed, in terms of condition assessment, criticality and the like, then even these shorter timeframe projects could still have in the realms of 2 or more years to be undertaken and completed. Whilst it is accepted that annual budget considerations are important as well, with the correct forward planning, time flexibility can still be managed and achieved.

Given that there a lesser number of the trenchless specialists it follows that their availability may be less than a traditional contractor. Giving flexibility to the timing or completion of a contract allows for these contractors to fit a potential project/contract into their resource scheduling, in turn providing the client with more options and opportunities.

6.3 GROUPING OF PROJECTS

In terms of grouping of projects this is about balance. Bringing a number of similar projects to market a one package means larger one-off mobilisation costs can be distributed over a greater quantity of work, potentially allowing a lower unit rate. However there are commercial risks in awarding a very large tender to a sole supplier. In some cases, other potential 'intrinsic costs' (as noted previously) can also offset these lump sum mobilisation costs, that are often higher for specialised trenchless techniques, than a more traditional open trench method. The Client, as noted in Section 4, Risks, needs to evaluate for itself how much risk and associated value, it places on the commercial aspect of awarding a single large package of work. The considerations to this are likely to differ for each client but may consider such elements as (i) the liquidity of the tenderer if a major incident occurs (ii) the risk of the works not being completed to outcome expectations and what contractual means the client has to re-dress this, (refer (i)), (iii) the impact of reduced workload on the other parties in the industry, both short and long term ie no work or they go looking for other work elsewhere. However, in this risk consideration, the Client should be honest with itself in terms of the real likelihood and consequences of these risk elements as well as weighing these up against likely benefits and costs. Experience will help a Client in terms of both aspects.

It should also be noted in the case where a Client cannot group enough of their own projects together that it may be advantageous to work with their adjacent 'neighbours' to create a sufficiently large enough package.

7. CONTRACTORS PROCUREMENT CONSIDERATIONS

Most of the previous discussion surrounded the Client requirements. Detailed hereafter is a summary of the key elements/aspects that some of New Zealand's leading trenchless contractors, in the new install and renewal fields, have suggested Clients also need to be aware of and allow for. In some cases they are reflective of the ideas previously promoted.

The comments have been grouped together into three common themes being (i) Pre-conceived ideas/Lack of knowledge or understanding (ii) Lack of Flexibility and (iii) the tender process.

7.1 PRE-CONCEIVED IDEAS

Lack of Knowledge or Understanding: these can be either in terms of what a client believes is possible, or not possible. In the former case this can lead to unrealistic expectations and then ultimately disappointment when the 'finished product' does not meet the Client's requirements or the project is not considered successful. In the latter case a Client's/Consultants lack of understanding or knowledge of what options are available limits or precludes a Contractor from offering a service/solution that would meet the required end output(s).

7.2 LACK OF FLEXIBILITY

Often trenchless machinery/products are quite specific or bespoke. A client's lack of allowable flexibility can therefore, at times, preclude a solution from being offered. For instance, Micro Tunnelling machines come, to varying degree's, in a fixed size or size range. Therefore if a Client, for instance, requires a 600mm diameter pipe but won't accept a 750mm pipe this may limit the number of contractors that have that exact sized machine. Similarly if a Client pre-purchases pipe, polyethylene (PE) for instance, then this will limit the trenchless methods that are able to use PE. As noted earlier in the paper, "open" output specific contracts allow for maximum flexibility. Specify the final output parameters and be "open" to all offers, albeit with rigorous checking to confirm they will meet the expected/required standards.

7.3 TENDER PROCESS:

Contractors, especially trenchless, have long offered/requested early contractor engagement/involvement. This is, in part, aimed to attempt to manage the two aspects noted above; ensuring the Client/Design Consultant is wholly aware of what can and can't achieved. This can also help in balancing the type and level of pre-tender/design investigations that need to be undertaken. The second aspect, from the contractor's perspective (not unsurprisingly) is that the tender process should be invited to contractors with the known/proven track record. Whilst this may appear to being quite specifically aimed toward a trenchless solution only, it doesn't have to be. A tender can still be invited to a range of trenched and trenchless contractors. Refer to Section 3 in terms of how then to evaluate the submissions in a balanced approach i.e. "comparing apples with apples". The same issue of not treating a trenchless methodology as non-conforming was also raised. The need, cost and value for a contractor to 'have' to prepare a conforming offer such that their 'non-conforming' offer is considered often deters a contractor from making an offer.

8 SUMMARY

Applications of the principles presented in this paper, and summarised below, should provide the Principal/Client with a range of competitive tenders, equally from trenchless specialists and traditional contractors. Development of Output Objectives and Performance Specifications will maximise the innovation and value of solutions offered.

- Develop procurement strategies that encourage Innovation and fair comparisons
- Don't try to pass risk to those not in a position to control or manage it
- Consider *ALL* costs and values, including social, safety and environmental, over the whole life of the asset

They will help to avoid the situation of a limited response from the industry marketplace and/or prices that include unnecessary loadings for risk or inconvenience. They will also provide the client with the opportunity to invest, in a controlled manner, in innovation and value added benefits.