

CHANGING LANES

Transportation Conference 2004

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Richmond, BC



BRITISH
COLUMBIA

Ministry of Transportation

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Preface

This is the best practices document that has come from the Changing Lanes meeting held on February 5, 2004 in Richmond.

The purpose of that meeting was to solicit dialogue between the Consulting Engineers of British Columbia, the British Columbia Road Builders Association and the Ministry of Transportation on how we can work together, consistently and successfully, in the delivery of construction projects.

During the Changing Lanes meeting, a fictitious project and a series of problems were presented to the audience. The audience, which consisted of representatives from the Consulting Engineers of British Columbia, the British Columbia Road Builders Association and the Ministry of Transportation, was invited to discuss these problems amongst their tables and come up with solutions.

After the meeting, these solutions were submitted to a committee to distill a best practices document in the sections of: 1) Authority, 2) Quality Control, Quality Assurance and End Product Specifications, and 3) Environmental.

First section	Authority: Rodney Chapman Ministry of Transportation Bill Swaine British Columbia Road Builders Association Chris Newcomb Consulting Engineers of British Columbia
Second section	Quality Control, Quality Assurance and End Product Specifications: Don Shaw Ministry of Transportation Ken Day British Columbia Road Builders Association Mike Bishop Consulting Engineers of British Columbia
Third section	Environmental: Mike Kent Ministry of Transportation Randy Zbytnuik British Columbia Road Builders Association Tim Bekhuys Consulting Engineers of British Columbia

Appendices as follows:

Appendix A : information about the fictitious project

Appendix B : summary of the table comments from the Changing Lanes meeting

Appendix C : Authority Levels for Consultants, including Definitions and Examples and Authority Levels Matrix

The web address to view or download this document online is:

http://www.th.gov.bc.ca/publications/reports_and_studies/changing_lanes/index.htm



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Introduction

This is a Best Practice Answer Guide. These best practice answers are to inform and guide members of the Consulting Engineers of British Columbia, British Columbia Road Builders and Heavy Construction Association and Ministry of Transportation on how we can work together consistently and successfully in the delivery of construction projects.

These best practices answers have come from questions raised and based on a fictitious project which is presented in Appendix A.

The fictitious project was presented at a Changing Lanes Conference on February 5, 2004 in which members from the Consulting Engineers of British Columbia, British Columbia Road Builders and Heavy Construction Association and Ministry of Transportation were invited to work through a series of questions associated with the fictitious project. The responses from the audience are included in Appendix B.

After the meeting, these solutions were submitted to a committee to distill a best practices document in the section of: 1) Authority, 2) Quality Control, Quality Assurance and End Product Specifications, and 3) Environmental.

The Committee members were:

Authority:

Rodney Chapman	Ministry of Transportation
Bill Swaine	British Columbia Road Builders and Heavy Construction Association
Chris Newcomb	Consulting Engineers of British Columbia

Quality Control, Quality Assurance and End Product Specifications:

Don Shaw	Ministry of Transportation
Ken Day	British Columbia Road Builders and Heavy Construction Association
Mike Bishop	Consulting Engineers of British Columbia

Environmental:

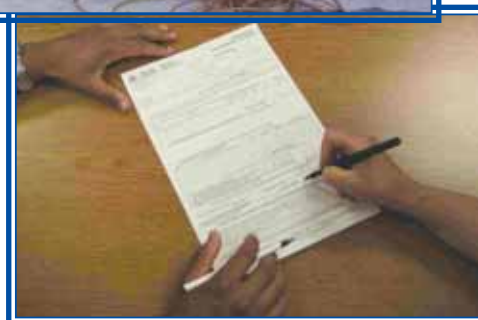
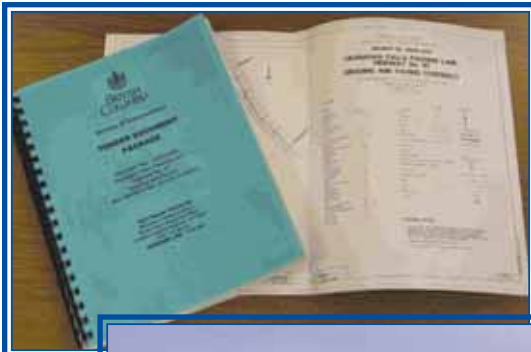
Mike Kent	Ministry of Transportation
Randy Zbytnuik	British Columbia Road Builders and Heavy Construction Association
Tim Bekhyus	Consulting Engineers of British Columbia

Throughout this answer guide, the Ministry Representative's line supervisor is referred to as the "Construction Manager". In practice, this person will likely be a Field Services Manager, the Regional Bridge Engineer, or other such person. References such as "GC x.xx" are to the "Major Works General Conditions" clause x.xx and "SSxxx" is to "Standard Specification for Highway Construction – Section xxx".

These answers are specific to the problem posed, but will provide a process that can be used to resolve any similar problem. Solutions will depend to a great extent on the site-specific facts, but the process used should be similar across many situations.

In Appendix C, a table is provided which outlines the authority levels for consultants including definitions and examples and authority levels.

AUTHORITY



A) Authority Breakout Session

1. The Contractor has approached you saying he is planning to start some work prior to the Preconstruction meeting.
 - What issues could arise as a result, and what actions should each party take to ensure a quick, coordinated, and appropriate response?
 - Who has the authority to allow the Contractor to start?

Issue

Contractual and practical constraints on starting work

Contractual Requirements

Bonds and insurance in place (GC 12.00; GC 16.01)

Appropriate Plans and permits in place (Special Provisions)

Risk Assessment/Process:

Risk assessment by Contractor – appropriate to level of work and risk

Variances through discussion between Contractor and Ministry Representative

Roles:

Contractor prepares initial plan

Ministry Representative reviews with stakeholders (Ministry of Transportation Construction Manager, Project Manager, District Manager, Transportation) to ensure critical risks are covered

Ministry Representative provides approval to Contractor

Scope of work approved may be limited

Best Practice: Discussion & Solution:

Generally, the authority to start work rests with the Ministry.

No work of any sort can commence on-site without confirmation that the required bonds and insurance are in place. The Ministry Representative must not approve any variance to this.

The Ministry Representative will need to discuss the early start with Insurance and Bonds, and the Construction Manager/Project Manager before communicating with the Contractor.

There may be some occasions where submittals are deficient on minor technical issues which would not affect the enforceability of the document (e.g. CGL insurance was \$2 million rather than \$3 million called for in the contract, but the risks associated with the work to be undertaken during the early start-up do not have risks beyond the provided \$2 million). The materiality of the deficiency should be discussed with Insurance and Bonds in Victoria and an appropriate risk review undertaken prior to giving the go ahead.

If these are not in place then either party could be faced with legal, liability issues (e.g. injured worker or public without award or insurance in place).

All of the general submissions (e.g. Notice of Project, Quality Management Plan;

Traffic Management Plan; etc.) and work-specific submittals (e.g. Traffic Control Plan, Sediment and Drainage Plan, Safety Plan, etc.) must be in place and approved. Under limited circumstances, the work can commence without plans that cover the entire Project, as long as all issues are covered related to the specific early work to be done.

Public communication, as appropriate to the impact, must be in place.

Again either party could be faced with legal or liability issues (e.g. contamination of creek without contact with Fisheries or sediment and drainage plan in place).

An on-site meeting should be conducted ASAP between the Contractor's superintendent and the Ministry Representative to discuss the work and mutually agree what of the above-mentioned requirements, submittals, or any other specific requirements must be in place before work can commence. A mutual agreement should be reached as to a date for mobilization and a date for work to commence.

As an underlying principle, before any work is undertaken or waiver given, you must look to all aspects of the contractual obligations, assess the risks and impacts, and make an informed determination of what course of action to take.

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2. **The Contractor plans on continuing with his detour work in the 1 kilometre section, but will be held up unless Telus can move their lines and poles by Monday next.**
- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Utility relocation
Delay

Contractual Requirements

Contractor to coordinate Utility moves (GC 23.00)
Ministry of Transportation to authorize moves (Ministry of Transportation/Utility Protocol Agreements)

Risk Assessment/Process:

Contractor assesses impact to planned work and assesses potential alternate work
Ministry Representative reviews and discusses with Contractor; assesses project impacts of the delay, and agree on mitigation strategies
Contractor sets up meeting with Telus, with Ministry Representative in attendance
Ministry Representative, in discussion with Construction Manager and Project Manager, approves any resulting extension of time, Reimbursable Delay, or Change to Work.

Roles:

Contractor coordinates Utility moves
Ministry Representative provides direction to Utility
Both parties do what they can to mitigate impacts

Best Practice: Discussion & Solution:

The Ministry Representative should review the protocol agreement for obligations of the parties.

The Contractor has an obligation to coordinate the Utility moves, and they are to be the primary party in a resolution. The Contractor should schedule an on-site meeting with the Ministry and the Utility Company to discuss the issue and hopefully formulate a solution.

The Ministry Representative reviews the original schedules of the Contractor and the Utility companies as well as the record of meetings and correspondence to see what has happened to date in regards to coordination and fulfilling work commitments. This will give a good chronological history of what has happened to date which will help in resolving any issues and getting the relocation completed on time.

If the Contractor has done a good job of coordination and it is Telus who is delaying the work, then an Extension of Time or perhaps Reimbursable Delay compensation may be considered.

In any event, mitigation of downtime is required from all parties—work must be rescheduled and appropriate risk management decisions taken to minimize any impacts. For the Ministry, this may mean weighing the costs of standby with those of remobilization or extra work compensation for “work around” solutions.

3. The contract has overrun the stripping quantities by \$30,000.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**
- **Who has the authority to approve the overrun?**
- **Who has authority to approve the overrun if it is by \$115,000**
- **Who has authority to approve the overrun if it is by \$350,000**

Issue

Quantity overrun

Impacts on other quantities and schedule

Authority to approve

Contractual Requirements

Change in Quantities, overrun (GC 38.00; GC 39.00)

Extension of Time (GC 44.00)

Risk Assessment/Process:

Assess reason for overrun to aide in determining impacts

Ministry Representative to review design, impact on other quantities, impact on budget

Contractor to assess impact on schedule, material disposal sites, borrow requirements, etc.

Designer to review design for off-setting economies

Roles:

Ministry Representative (in consultation with Project Manager) to approve if overall Contract Price will be exceeded and any extension of time

Best Practice: Discussion & Solution:

The strict answers to this question lie with the authority:

- The value is above the Ministry Representative's \$25,000 limit and must be authorized by the Project Manager and/or Construction Manager (up to \$50,000)
- The \$110,000 must be authorized by the Regional Director (up to \$200,000)
- The \$350,000 must be approved by the Assistant Deputy Minister (over \$200,000).

Notes:

- The limits to authority are cumulative over the life of the project—once one person's authority is exceeded, all further requests must go further up the ladder
- Should any of the above positions be filled by a consultant, the approval authority must be referred to a Ministry person

However, none of the above authorization is required unless the Contract Price has been exceeded. To determine that, all the potential impacts must be assessed. In many cases, a stripping overrun is offset by a corresponding underrun in the Type D quantities, and there may be no net impact to the project. In the case of a stripping overrun in a fill area, the embankment quantity will increase and create a corresponding overrun in Type D. Haul and overhaul can also be impacted.

If the quantity overrun is going to be significant, you may want to consider design revisions that will provide offsetting relief and bring the contract in on budget.

The Ministry Representative should see if the stripping overrun was an oversight of one isolated area or caused by bad geotechnical information (drive-by estimate) or by over excavation by operator/equipment etc. The Ministry Representative should draw on whoever can help him understand the change and a recommended action. He should discuss this with his Construction Manager and ask that the Project Manager be informed of the recommended action.

The Contractor should be informed of whatever action is to be taken either during the month or when reviewing the monthly progress estimate depending on the severity of the recommended action.

The Ministry Representative and the Contractor should get together and determine whether there is going to be net overrun in quantities, review potential solutions, and then address the potential issues of a revised unit price, as stripping is a Major Item.

The Project Manager and Construction Manager should be kept apprised of the cost risks and projections revised accordingly.

The intent of the question could be to focus the group to the problems that are associated with inaccurate information or quantity estimates which translates itself into additional costs and the need for spending authorization.

The question should identify the total quantity, the overrun quantity and the additional cost so the group can hopefully equate quantity and cost and how fast the additional cost can add up with quantity shifts.

The size of the overrun has to be looked at in light of the overall project quantities. Small variances in quantities are normal and they should be reviewed in relationship to the other affected quantities and in terms of trends that could possibly evolve as the project is constructed. To ask for authorization for every small overrun could create a false forecast of costs when in reality the project could cost less in the end. So before any authorization for additional budget is contemplated, the supervisor should take a hard look at where the change is and whether it will actually add cost to the contract.

The reverse can also occur when large quantity overruns are encountered which need to be addressed in a similar manner in that the overrun could have a major effect on the other quantities, direction of hauls, availability of cut, embankment requirements etc. Knowing this could trigger design revisions to balance quantities, and if the funding is not available, the downsizing of the project is a possibility to keep the project within the budget.

The authorization is the last formal approval to spend the money. The review and a good understanding of the overrun and the documentation of the cost implications must involve the appropriate team members so the correct request for funding is presented only once.

4. There are delays during the expropriation of a commercial property, which will impact the haul from the cut to the embankment. The Contractor requires this piece of property to complete the work according to their schedule.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Access to site
Reimbursable delay
Extension of time
Change to Work

Contractual Requirements

Ministry of Transportation required to provide the Site (SPs)
Contractor to provide Notice (GC 37.00; GC 42.00)
Mitigation (GC 74.00)
Property Agent is sole contact with property owner (Due to potential expropriation sensitivity)

Risk Assessment/Process:

Contractor assesses impact on schedule and completion date and determines potential mitigation strategies
Ministry Representative to follow-up with Property Agent, advice Project

Manager, discuss mitigation

Ministry Representative authorizes changes to compensation/schedule

Roles:

Ministry Representative approval of changes, in consultation with Construction Manager and Project Manager

Contractor and Ministry parties document costs and impacts

Best Practice: Discussion & Solution:

The question raises the various options that exist for the Ministry/Contractor to avoid a reimbursable delay caused by property acquisition not completed by the date indicated in the contract.

Neither the Contractor nor the Ministry Representative should approach property owners directly, as it may become an expropriation.

This is a clear cause of a Reimbursable Delay and the Ministry will be prepared to compensate accordingly, under the contract conditions. Note that the mere existence of a cause does not mean there are compensable impacts—it may be possible to work around the problem without any significant impact to either party.

Similarly, it is primarily the Ministry Representative who must address the problem as the cause is within the Ministry's sphere of responsibility.

The first avenue for solution between the Contractor and the Ministry is to see if there is a construction solution to the issue (remove cut up to the existing right of way and move equipment to another area on the project) without impacting or effecting the Contractor's schedule. If a solution is found this should be followed up with something in writing as the acceptance of the mutually agreed change.

The Ministry Representative should be in touch with the Construction Manager regarding the hold up who in turn will contact the Property Agent regarding completion of the acquisition and possession of the right of way. The agent should meet with the Ministry Representative and understand the implications of the property hold up to see how long it will take, the likelihood of expropriation or if there is another way of acquiring the land e.g. separate License to Construct.

If the right of way possession is to be a major time and cost problem, the Ministry Representative should be discussing the issue with the Project Manager/designer/geotechnical to see if a design revision is feasible (fill in ditch, wall, steeper cut slopes, etc.) which will allow for the work to progress and avoid the purchase of the property. A cost comparison should be performed to make sure the design revision is cost effective.

If no solution can be found, the Contractor and the Ministry Representative should be in daily contact, managing the mitigation of impact. Each party should keep accurate records of Contractor's activities until the property becomes available, ideally signed off on a daily basis, to provide solid records to assess Reimbursable Delay compensation.

5. The Contractor calls the Ministry Representative and says he cannot open the highway because the rock cut has a large rock mass he considers unsafe.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

Worker/public safety

Traffic flow

Geotechnical assessments and perception of risk/liability

Delay

Contractual Requirements

Public safety (SS135; SS 145)

WBC Regulation

Engineer of Record; Blasting Consultant responsibilities (SS 204)

Risk Assessment/Process:

Contractor assesses risk to workers and public, in conjunction with Ministry Representative

Ministry Representative reviews for mitigation strategies to get traffic flowing, involving Construction Manager

Geotechnical “Engineer of Record” reviews and determines safety of site and, in discussion with Ministry Representative and Construction Manager, control measures necessary

Roles:

Contractor communication plan to notify all concerned parties

Engineer of Record determines potential solutions

Construction Manager resolves technical issues with Engineer and Contractor

Consultation between Construction Manager and Project Manager

Ministry Representative authorizes and changes to contract

Best Practice: Discussion & Solution:

The intent of this question is to draw the group’s attention to the safety issues within construction projects, the authority level for closing a highway, and the communication responsibilities when something like this occurs.

The site-specific variables make this a question that may not lead to a consistent answer, as there will always be subjective assessments by disparate parties.

The Ministry Representative and the Contractor must weigh the benefits of traffic flow to the risks of injury should the mass slip.

If the highway is to be left closed for longer than 20 minutes or the closure time stipulated in the Special Provisions then the Ministry Representative should inform the District Manager, Transportation and the Regional Director of the problem.

The Contractor should contact the local authorities as set out in his contact list for emergency problems as well as have the local radio station and the Provincial Traffic Centre in Region 1 notified of the problem.

Both the Ministry Representative and the Contractor must immediately meet on-site and review the situation and agree on the necessary action to resolve the issue so as to get traffic back to normal ASAP. Some items to be considered are:

- Can the unstable mass be removed and how long will it take?
- Is there a requirement to involve a Geotechnical Engineer as the mass is too large to remove in a reasonable time?
- Is it safe for the workers to work on the rock mass?
- Is it feasible and safe to open the highway and place a safety spotter to watch the unstable rock mass?
- Is it feasible to construct a berm to contain the potential slide?
- Is it feasible to detour traffic on-site or off-site?

The geotechnical designer “Engineer of Record” should be called in to assess any stabilization measures that are required. The availability of the engineer may be such that he can participate in the immediate issue, but that is likely to be a rare event.

In all likelihood, the issue will need to be addressed immediately, in the field by those on-site. It is unlikely that anyone else would be available in a timely fashion to help with the decision, and telephone contact would likely be an inadequate means of communicating the true nature of the problem.

You may have to determine a course of action, implement it, and then inform others of what you have done.

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6. **The bridge design drawings call for the installation of 8 friction piles, 25 metres long, at the north abutment of Coho Creek Bridge. During the installation, bedrock is encountered at depths ranging from 5 to 15 metres at the 4 easterly piles.**

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issues

Design change

Change in quantities

Delay

Contractual Requirements

Changed Conditions (Glossary of Terms; GC 38.00)

Change to Work (GC 41.00)

Risk Assessment/Process:

Determine the extent of the problem, if economically/technically feasible

Structural designer must assess impact on design

Contractor assesses potential impacts on schedule and proposes mitigation strategies

Roles:

Structural Designer determines solution

Contractor and Ministry Representative document costs and impacts

Contractor and Ministry Representative discuss and agree upon mitigation strategies

Internal approvals from Project Manager

Ministry Representative provides the Contractor with the authorized changes

Best Practice: Discussion & Solution:

There are two main issues—the pile design issue and the issue of how the pile changes affect the contract.

The Ministry Representative must arrange to get the designer involved and to provide the Contractor with the required revisions to the pile designs ASAP. The bridge design engineer must be notified of the changed conditions and must provide direction regarding what is acceptable from a design point of view. It may be unacceptable to have some piles end bearing on bedrock and some acting as friction piles. There may be issues due to differential settlement. There may also be issues with the design of the lateral loads on the piles if they are not long enough to mobilize the required lateral forces.

Once the design is finalized and provided to the Contractor, then the Ministry Representative must determine the ramifications of the changes to the contract. It may be possible to cover the changes using the Unit Prices for the piling work. If not, then a Supplemental Agreement may be needed to cover the changes to the work. There may also be schedule implications depending on how long the Contractor was delayed while the design issues were sorted out.

It is important to not delay the work any longer than possible and the response time from the designer/geotechnical must be ASAP to avoid any delay impact costs due to the changed work. The Contractor has the ability to keep his crew busy with other work but that is somewhat limited and he must be confident that a decision will be forthcoming ASAP to avoid the potential of not meeting scheduled work activities at a later date.

Assess potential for extended Fisheries window and obtain appropriate approval from Department of Fisheries and Oceans. The Ministry Representative would coordinate the Contractor and Department of Fisheries and Oceans to obtain the permit extension.

The Ministry Representative must carefully document the circumstances related to the changes in order to be able to address any claim for extra payments or delays by the Contractor.

Depending on the exact circumstances, the Contractor may be entitled to compensation for changed quantity, Changed Conditions and/or Reimbursable Delay.

7. In August 2004, the Contractor has submitted a girder erection scheme two weeks prior to the planned erection date. The drawings were submitted to the bridge design engineer for review. The bridge design engineer has stated that the erection procedure is incomplete and that there are concerns with the procedure that need to be addressed. The Contractor does not agree with the review comments and has stated that they will proceed with the erection tomorrow as planned.

- As the Ministry Representative, what would you do?

Issue

Contractual interpretation responsibility (No specific guidelines on what is required for approval)

Ministry Representative's role in "Approval"

Dispute resolution

Contractual Requirements

Contract requires plans to be approved by the Ministry Representative (Special Provisions; Bridge Special Provisions/Appendices)

Risk Assessment/Process:

Erection plan must provide sufficient information to enable a third party to assess the safety of the erection scheme both for the new structure and for adjacent existing structures

Ministry Representative coordinates direct contact between Contractor's and Ministry's engineers

In the absence of consensus, the Ministry Representative adopts the Ministry engineer's view

Ministry Representative takes input and provides direction to Contractor

Mitigation strategies are required if the delay is anticipated to be consequential

Roles:

Ministry Representative to understand and use whomever is appropriate review authority / technical expert

Review done by Engineer of Record for design or Ministry of Transportation engineer for existing structures

"Performance under protest" applies

Best Practice: Discussion & Solution:

The Ministry Representative must advise the Contractor in writing that the erection procedures do not comply with the contract requirements and that erection must not proceed. Specific non-compliant issues must be documented by the Ministry Representative and provided to the Contractor.

The Ministry Representative should coordinate a discussion between the Contractor's erection engineer and the Ministry's review engineer to ensure that all risk issues associated with the procedure are identified and dealt with. Both parties must understand the risks involved, their likelihoods and consequences, and reach consensus on the acceptable level of risk.

In the event that the parties cannot agree, the Contractor is expected to comply with the Ministry's request. This does not imply that the Contractor has lost any right to compensation, it only invokes the principle of "performance under protest": Work now; claim later.

If time allows, the Ministry may seek further professional opinion.

If the Contractor chooses to proceed, then the Ministry Representative must issue a Stop Work Order. We must not allow any work to be undertaken when we believe that work may present an unwarranted hazard to the public, workers or the infrastructure, even if the Contractor is willing to take the risk.

The Ministry Representative and the Contractor must carefully document the circumstances related to this issue in order to be able to address any claim for extra payments or delays by the Contractor.

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8. **During October 2003, the Paving Subcontractor says to the Ministry Representative "It's too cold to pave". The Subcontractor is not prepared to pave bottom lift under these conditions even though this will mean he does not meet his milestone date. It is late in the season and it is unlikely that the paving will be completed until the following spring.**

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Public safety versus quality

Contractual Requirements

Public Safety (SS 135; SS 145)

Quality (Unacceptable Work – Glossary of Terms)

Risk Assessment/Process:

Assess risk of not paving to public safety, schedule, etc.

Assess reasons for late paving

Assess waiver of bonus/penalty

Discuss responsibility for repairs in spring

Roles:

Contractor to assess the likelihood of their being able to meet specifications under the anticipated circumstances, and the anticipated performance of any such pavement

Ministry Representative discusses with Construction Manager, District Manager and Project Manager, and decides which path to take

Best Practice: Discussion & Solution:

This is a good question to identify that there could be a shared risk and a mutual benefit to proceeding with some work in less than ideal conditions. The situation the Contractor now finds himself in could have been caused by either the Ministry or the Contractor himself which could translate into total or shared responsibility.

This is the first lift which could be placed either on gravel or a combination of gravel and/or pavement.

The milestone date to complete the first lift was stipulated in the contract probably due to operational, safety, drainage or whatever reason and must be reviewed with the Construction Manager/Project Manager to see if the need is still required. If the need is not justifiable other than to spend money within the fiscal year allocation then the paving should be delayed until the following spring when weather is more acceptable, risk is minimal and there is more chance of success.

If the paving must be completed as contracted, the following are some possible answers:

If the Contractor has fallen behind schedule due to his own doing then he should be looking at methods of accomplishing the work by the milestone date otherwise he could be declared in default of a contractual obligation. Methods such as heaters or even being faced with replacement of some pavement the following year is the risk the Contractor is forced to take. All costs are for the Contractor's account as he bid the contract with a clear understanding of his obligations.

If the Contractor has been delayed due to reasons outside of his control (e.g. adverse weather, revised design, late award, etc.) then there is some risk that could be assumed by the Ministry. The Ministry Representative and Contractor should discuss the issues and the Contractor should put his concerns and cost implications in writing which the Ministry Representative can discuss with the Construction Manager/Project Manager.

An agreement should be reached whereby there is a shared risk for any remedial work as the Ministry determined that there is an operational need to complete the first lift before winter sets in and the Contractor could not fulfill that requirement as detailed in his impacted schedule.

This can be a common scenario on many projects that want to be made operationally safe for the winter shutdown. By working together and using some innovative techniques, the project is made secure usually at little cost and can be useful in allowing the embankments to consolidate and having traffic point out any weak areas in the grade before paving of the final lift the following year.

The key idea is that the Ministry Representative and Contractor should look at both the pros and cons of any action—the benefit of having bottom lift in place may well offset any minor repair costs.

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9. **The Contractor with his crew and equipment has shown up on-site to install a culvert—a two-day job. A lane closure and two traffic control people are required. Due to a communication mix-up between the Contractor and the traffic control people, the delineators are not on-site but instead are located in a storage shed three hours away from the job site. The Contractor wants to “make do” with the traffic control equipment that they have available on-site. The Contractor states that they will take responsibility for any problems.**

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Public safety, driver expectancy

Contractual Requirements

Traffic Management Plan (Special Provisions; SS 194)

Traffic Control Manual for Work on Roadways

Risk Assessment/Process:

Contractor to assess impacts and potential variations from Traffic Management Plan

Ministry Representative to review and approve, potentially in consultation with District Manager

Roles:

Contractor to provide site-specific traffic management plan, based on resources available

Ministry Representative approval

Best Practice: Discussion & Solution:

This scenario is typical of what can happen on projects due to miscommunication for whatever reason and this question could show that there is flexibility in some operational requirements but the amount of flexibility will depend on the severity of the risk.

The Contractor and the Ministry Representative must discuss the issue with the involvement of the traffic control supervisor and decide if there is a way to start the work or a segment of the work with a traffic scheme that will be acceptable to the Ministry and is in compliance with the requirements as set out in the Traffic Control Manual for Work on Roadways. A plan must be developed around the available resources, and then implemented.

The delineators can be substituted with cones if the speed is below 70 km/h so that could be one way of making the work layout compliant with the manual but this should be discussed and accepted before implementation.

If it is decided that the delineators are required due to traffic, visibility etc. then the work will not start until the proper equipment is on-site regardless of the Contractor stating he will take full responsibility. If someone was injured due to improper traffic control then the Contractor and the Ministry could be found liable.

The Ministry must not allow any work to be undertaken when we believe that work may present an unwarranted hazard to the public, workers or the infrastructure, even if the Contractor is willing to take the risk.

-
10. The contract has a milestone to have km 2 to 3 open by March 31, 2004 and, unbeknownst to the Contractor, this provision was included because the big-box developer will pay the Ministry \$500,000 to complete the work by then. It's March 24th, there is a week's work left for top lift paving and placing sidewalks but the forecast calls for continuous heavy rain all week.

- As the Ministry Representative, what would you do?

Issue

Compliance with time schedule
Establishment of milestones
Quality versus money

Contractual Requirements

Compliance with time schedule (GC 33.00)
Failure to meet milestone date (GC 33.02(b))

Risk Assessment/Process:

Contractor to assess methods that could be used, likelihood of achieving specifications and potential problems with product
Contractor and Ministry Representative, in consultation with Construction Manager and Project Manager, to assess mitigation measures
Project Manager with Construction Manager to assess the likelihood of renegotiating funding agreement

Roles:

Contractor is responsible to achieve the Milestone work
Ministry Representative approves mitigation measures
Project Manager is responsible for the Ministry of Transportation/Developer Agreement revisions

Best Practice: Discussion & Solution:

Note: Under the new Major Works Contract GC 33.02(b), there can be financial consequences for failing to meet a milestone. Such assessments may have been possible under the old agreement, but did not have pre-agreed values assigned to them.

As the dollar value is high, extraordinary efforts should be made to meet the milestone. If the value was lower, the resolution might be different.

This scenario is similar to question No.8 but it involves a third party and the loss of a substantial sum of money if the commitment is not accomplished. This commitment should be clearly defined in the Special Provisions so that the Contractor understands at the time of bidding the seriousness of the commitment and the scheduling requirements to ensure the milestone date is adhered to.

Obviously if the Contractor paves the final lift in the pouring rain, it would be in contravention of the Standard Specifications and in all likelihood would be rejected.

Assuming the Special Provisions were clear as to the requirement for the milestone date, the Contractor should have produced an appropriate construction schedule with enough float to ensure completion by the milestone date. The schedule would be reviewed with the Ministry on a regular basis to ensure the work is progressing as scheduled.

If the Contractor fell behind schedule due to his own doing then the Ministry would want to set-off any sum of money against the Contractor that wasn't

received by the Ministry due to missing the milestone date. In this case, as the payment was not disclosed to the Contractor, it was not a foreseeable risk to him and he could not be held liable for its loss. Had the sum been disclosed, they would be liable for the whole of it.

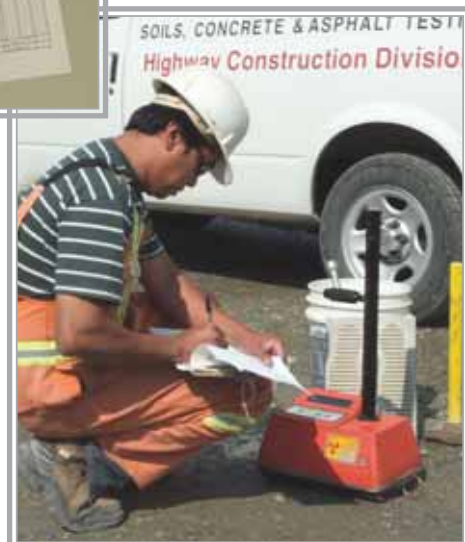
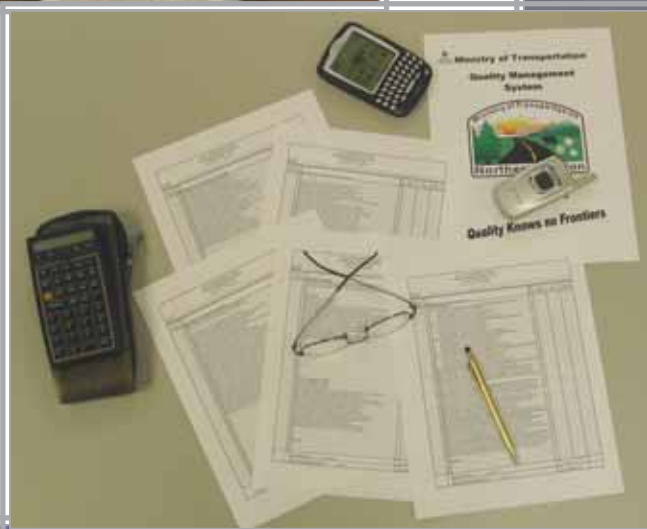
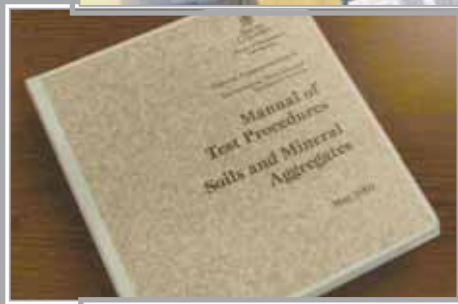
They would, however, be liable for a reasonably expected impact, including possibly some business loss claims.

The Ministry Representative should be in regular contact with the Construction Manager/Project Manager and see if there is a way of meeting the conditions of the developer's contribution and avoid charging the Contractor for lack of performance. The Ministry should review the situation with the developer to see if there is anything in the agreement that would allow the roadway to be fully operational with traffic operating on the first lift. Any additional costs due to having the roadway declared operational in this interim condition would be to the Contractor's account.

Obviously the Ministry would be in an awkward position and would be at the mercy of the developer who could easily be uncooperative knowing he doesn't have to pay the \$500,000.

We might see more and more of these situations so it is imperative that the project identifies clearly the requirement for the milestone so the Contractor understands the commitment.

QUALITY CONTROL, QUALITY ASSURANCE and END PRODUCT SPECIFICATIONS



B) Quality Control, Quality Assurance and End Product Specifications Breakout Session

1. The Contractor is in non-compliance with their Quality Control Plan. They have changed staff without advising you.

- As the Ministry Representative, what would you do?

Issue

Compliance with contractual conditions

Importance of various aspects of Management Plans

Accommodation of minor variance

Contractual Requirements

Special Provisions require notification of any change to Quality Management personnel

Risk Assessment/Process

Contractor can change staff, in accordance with contract

Ministry Representative assesses acceptability of the staff and determines relative importance of non-conformance, in light of past performance

Roles:

Contractor to provide notice to Ministry Representative of change in personnel

Ministry Representative approves changes if necessary with consultation, consultation with other team members

Ministry Representative uses continual improvement aspects of Quality Management: Waive first occurrence; Non-Conformance Report (NCR) second; Stop Work for third

Best Practice: Discussion & Solution:

This is a relatively minor non-conformance and should be dealt with accordingly. We are partnering and do not threaten Stop Work Orders for minor issues, but do expect continuous improvement in all aspects of the work.

For a first occurrence, remind the Contractor of the contractual obligations and the reasons therefore. Indicate that for serious issues or for repeat non-conformance on this minor issue may result in a Stop Work Order being issued.

If this is a key position (such as the Quality Manager) the Ministry Representative should take a harder line, but still approach the issues as being part of the learning curve.

Request that the Contractor provide an updated Quality Control Plan reflecting the change.

2. The contract specifications require a quality control testing frequency for densities in earth embankment that seems excessive to practical requirements. The Contractor approaches you and asks that the frequency of testing be reduced by at least two thirds.

- As the Ministry Representative, what would you do?

Issue

Waiver of contractual conditions

Frequency requirements

Contractual Requirements

Minimum testing requirements (SPs)

Variance provisions (SPs)

Risk Assessment/Process:

Contractor to assess procedures and past test results, and provide plan to ensure future compliance with reduced testing

Ministry Representative, potentially in conjunction with the Construction Manager, reviews Contractor's submission and assess risks, proposes compromise if appropriate, and sets conditions for waiving/modifying specifications

Roles:

Contractor proposes changes

Ministry Representative approves

Ministry Representative and Contractor monitor performance

Contractor modifies procedures as necessary

Best Practice: Discussion & Solution:

This is clearly in keeping with the intent of the Quality Management language.

The Contractor must be able to provide evidence that his practices and results consistently show that there have been no significant cases of failure to meet the compaction specification

They would also have to demonstrate that their procedures would be monitored, tracked and modified accordingly, including returning to higher frequency testing, in the event that future testing shows non-conformance.

Generally, the Ministry would NOT request a price reduction as a result. We are committed to providing reasonable payment for quality work not for quality testing. If the Contractor goes the extra mile to build the quality in, such that they can reliably test a lower frequency, then the Ministry has achieved a higher confidence in the quality. In the long run, a Contractor with a proven Quality Management Plan will be able to bid less testing costs as he knows he will be able to convince the Ministry Representative that reduced frequencies are acceptable.

If a particular frequency is regularly being modified, then it is probably time to revise the specified minimum frequency accordingly. Such suggestions can be made through the Provincial Construction Manager.

3. Once the Quality Control Plan is acceptable for the interlocking block supply, and production and delivery begins, you ask the Contractor for his back-up documentation for the quality control done to ensure the blocks meet the specifications. The Contractor supplies you with two tests showing that the blocks meet the required 20 MPa strength. 500 blocks have been delivered to the site. You have no way of knowing if the test results are for those blocks delivered to your project.
- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

Supplier Quality Control

Contractor responsibilities for supplier goods

Contractual Requirements

Quality Control Special Provisions

Risk Assessment/Process:

Contractor's Quality Control Plan should detect lack of documentation and correct the shortfall, including issuing internal NCR

Contractor to assess alternate means of testing supplied blocks

Ministry Representative assesses compliance and effectiveness with Contractor's Quality Control Plan

Ministry Representative assesses potential impact to the project as a result of uncertain material and reviews Contractor's submissions

Roles:

Contractor is responsible for Quality Control of all products, and must ensure suppliers are performing

Ministry Representative's Quality Assurance program should look at Contractor's compliance with their plan and the contract specifications.

Ministry Representative approves the resolution of the issue

Best Practice: Discussion & Solution:

The Quality Management specification requires significantly higher frequency of testing and requires product tractability, so product and testing can be matched. The outlined circumstances warrant an NCR.

The Contractor's Quality Management Plan should have detected the shortfall in documentation and they should have issued an internal NCR. If so, the Ministry Representative simply monitors the resolution process, provides assistance or guidance where suitable, and awaits the results. If they have not done so, you would issue them the NCR.

The Ministry Representative should meet with the Contractor, and discuss the concerns and request that the Contractor provides resolution.

Contractor must demonstrate that the actual product received conforms to the specifications.

The Ministry's Quality Assurance Plan may involve on-site testing or review at the supplier's plant. In the absence of the Contractor Quality Control, good Quality Assurance results are generally NOT enough to warrant acceptance of the product.

Ensure that the "Continual Improvement" processes of an ISO based Quality Management Plan are followed—i.e. do something to ensure that this does not happen again, for these or any other materials delivered to Site.

Contractors must ensure that their suppliers are aware of their obligations to perform Quality Control

The Contractor should be performing their own random testing on the product to ensure that the suppliers are fulfilling their obligations. Depending on the quality of the supplier and their Quality Control Plan, this can be minor to quite intensive. Actual testing of products would be rare, but should be considered for any item that is critical to the performance of the work. If the wall is short or does not support the road, repairs would be easy so risks may be low; if the wall is six or seven rows high and supports the Trans Canada Highway, risks are considerably higher.

For the materials on-site, a series of considerations are open to the Ministry Representative are:

- Random sample and test on-site
- Depending on the criticality of the installation, the reputation of the supplier, the conditions at the time of casting, how far above the limit the existing test results were, etc, you may make a risk management decision that the blocks will be accepted. In such an event, a price reduction would be appropriate.
- Last resort, reject the entire batch, at the suppliers cost (if the Contractor had not obligated the supplier to the contractual Quality Management provisions, then this may be to the Contractor's account).

-
4. **The Contractor has hired a rock expert to design a blast plan for the project. You are given a copy of the plan and in your Quality Assurance review you notice it does not meet the specifications of the contract in spacing of the shearline holes. The contract requires 750 mm spacing and the design shows a spacing of 1250 mm. You discuss this with the Contractor and he argues that his design will give the desired results and this design is only for the first test section anyway. Once they look at the results, they will tighten up the spacing if required. The test section has a volume of about 5,000 m³.**

- **As the Ministry Representative, what do you do?**

Issue

What are reasonable variances from specification for a test section?

Contractual Requirements

Backline hole spacing (SS 204)

Conformance to lines and grades (GC 18.02)

Risk Assessment/Process:

Contractor's Blasting Consultant reviews contract requirements and determines applicable design details, assesses the rock characteristics and location of the cut, and proposes variances as appropriate

Ministry Representative, in consultation with geotechnical Engineer of Record, assesses risks to the long-term performance of the cut and approves any acceptable variances

Roles:

Contractor is responsible for ensuring blast and its results meet contract requirements

Engineer of Record responsible for assessing impacts

Ministry Representative participates in discussions and provides instruction to the Contractor

Best Practice: Discussion & Solution:

5000 m³ would normally be considered too large for a test section. 500 to 1,000 m³ would be a normal size.

Only in circumstances where you have intimate knowledge of the characteristics of the rock or have successful past practice, should the starting spacing be relaxed.

Remind the Contractor that the intent is to ensure the quality of the work, and that the appropriate manner to do that is not to take a downside risk without sufficient in-situ information.

Request that the Contractor revise the test shot holes to be at the contractually required 750 mm centers. Indicate that, should the results be good, then hole spacing may be incrementally opened up in the production runs or by having further test section sized blasts to test wider spacing before going to full production run size blasts.

If the Contractor continues to argue, issue a "Ministry Instruction" requiring the Contractor to comply with the contact spacing requirement. Ultimately, a Stop Work Order may be required.

5. Contractor presents Quality Control results indicating aggregate gradation is just in specification.

- As the Ministry Representative what would you do?

Two days later, Quality Control results indicate the gradation is just out.

- As the Ministry Representative what would you do?

Two days later, Quality Control results indicate the gradation is further out.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

Targeting the bar

Staged responses to continuing issue

Contractual Requirements

Aggregate Specifications (SS 202; SS 501; etc)

Risk Assessment/Process:

The Contractor, under its Quality Control Plan, should monitor the activity and proactively take preventative action

The Ministry, under its Quality Assurance Plan, monitors the Contractor activities and the product

Ministry assesses impact of variance from the gradation banana

Roles:

Contractor is responsible to ensure product is in specification, to monitor work and take action to prevent production of out-of-specification materials

Ministry monitors process and product and takes progressively stronger action as degree of variance and/or duration of non-conformance increases

Best Practice: Discussion & Solution:

First, it appears that the Contractor may be “targeting the bar”, i.e. aiming to do the least possible amount of work necessary, getting a product that just meets specification. In such a case, the Ministry Representative should discuss the risks of such a plan and the consequences of failing to meet the specification. If the Contractor continues, the Ministry Representative should consider vigorously applying the specification: i.e. there is no “gray zone” — if you are out of specification at all, the product is rejected.

For the rest of the issue, there are two different answers, based on the type of aggregate being produced: paving or base.

For paving aggregates, the risk to the product does not arise until the aggregate comes out of the asphalt mix plant, so the Contractor can be given considerably more latitude in addressing the issue. They will be doing considerably more processing before mix is made and the product inadequacies can still be fixed.

However, the Ministry Representative should talk with Contractor advising of the Quality Assurance results and that this may indicate that they could place them in reject or End Product Specification penalty; encourage Contractor to try and make adjustments to move gradation away from limits.

For base aggregates, the product going into the pile is essentially what will end up on the road so the non-conformances must be addressed immediately.

Stage 1: Inform the Contractor of your test results. Discuss potential problems, inquire as to what controls they have in place and indicate that you will be monitoring closely. Ministry Representative should outline potential consequences if Quality Assurance results indicate non-conformance. Step up Quality Assurance testing.

Stage 2: You should expect an NCR from Contractor and, if they have not done so, you should issue them with two NCRs, one for an out-of-specification process and another for failing to do Quality Control or take remedial action to prevent continued production of non-specification material from Ministry. Expect product control. The timelines given show that this non-conformance has been

continuing for a far longer period than one would expect on a normal crushing operation, so this may warrant a Stop Work Order.

Stage 3: Stop Work order.

Although the Ministry Representative will not direct the Contractor, proactive communication is strongly encouraged.

If you foresee a problem that may be, or is arising, bring the issue to the attention of the Contractor. Look for early prevention and resolution of problems.

Make suggestions to the Contractor, such as that they may want to start a new stockpile in order that the previous material would not be contaminated with the more recent out of specification material; again encourage adjustments to production of aggregates.

6. Ministry Representative has completed smoothness testing on a section of newly resurfaced pavement. Expecting good results, both you and the Contractor are surprised at the poor test results.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Testing reliability

Tests at odds with “gut feel”

Contractual Requirements

Smoothness specifications (SS 502)

Risk Assessment/Process:

Contractor and Ministry assess potential reasons for unexpected results

Calibrate equipment, rerun tests as appropriate

Roles:

Contractor is responsible for scratch line and cleanliness of the roadway, and is entitled to appeal test results

Ministry is responsible to ensure equipment is calibrated and operator is qualified

Best Practice: Discussion & Solution:

Any process can be affected by systematic errors. The Ministry Representative and the Contractor should be aware of the potential causes of such errors and look to those areas first to see if things have been done correctly.

Consider running the profiler on a Ministry test strip or through a closed loop to ensure it is functioning correctly.

The Ministry Representative should review actual smoothness test procedure; discuss results with Contractor and offer to retest a sample section. Such an offer is not expected to be a blanket re-running of the test, but just a representative section to confirm the results.

Contractor should review the installation and quality of the guide line for profiler.

If the results are confirmed, the results stand.

7. **Quality Assurance testing for 4,000 tonnes of asphalt mix indicates the material is in maximum penalty under the End Product Specification guidelines for asphalt content. The Contractor chooses to appeal the results. The appeal testing indicates the material is actually in reject.**

- **As the Ministry Representative, what would you do?**

Issue

Appeal testing

Waiver of rejection, for compensation

Contractual Requirements

Appeal testing (SS 502.23)

Risk Assessment/Process:

The Contractor assesses the reasons for rejection, considers the impact on the long-term performance of the product, the possible remediation measures and their likelihood of success and proposes resolution

Ministry Representative, in conjunction with the Construction Manager and Project Manager, considers the long-term performance and assesses the proposed resolution

Roles:

Contractor responsible for the remediation

Ministry Representative authorizes the acceptable actions and any reduction in compensation

Best Practice: Discussion & Solution:

Ministry Representative advises the Construction Manager and the Contractor of the results and requests plan from the Contractor to remediate the deficient pavement.

There is no appeal from the results of appeal testing.

The final determination of whether any remedial measures or waiver would be acceptable to the Ministry will lie with the Construction Manager, in consultation with others. The decision will be given to the Contractor by the Ministry Representative.

Depending on the location and severity of the problem, site-specific conditions may allow the Ministry to accept the product at 100% penalty (i.e. accept it as-is, but no payment). This is costly to the Contractor, but less costly than milling it out and replacing it.

Other payment reduction amounts may be considered. If so, all costs and impacts have to be assessed and an appropriate price deduction determined. As an example, if pavement life was designed to be 20 years but is anticipated to be only 10 years, the payment would not be more than 50% and should be substantially less to reflect the increased risks.

8. **The Contractor wants to start but they have not submitted their Traffic Management Plan.**

- As the Ministry Representative, what do you do?
- What are your options for compliance?
- What if they start with just some “minor” traffic control with a promise to submit the full plan next week?

Issue

Public safety and drive expectancy

Contractual Requirements

Special Provisions

Traffic Control Manual for Work on Roadways

SS 194; SS 145

WCB Regulation

Risk Assessment/Process:

If work affects traffic, a TMP must be in place

The specific risks at the specific site must be addressed

Plans can cover specific portions of the site

Roles:

Contractor is responsible for ensuring a plan is in place of all work

Ministry Representative, in consultation with Traffic Engineer, approves plan

Best Practice: Discussion & Solution:

The Contractor will submit a Traffic Management Plan under all circumstances where traffic may be impacted. Without a Traffic Management Plan, no work affecting traffic shall commence.

Best practice is to have all plans (Traffic Management Plan; Quality Management; Sediment and Drainage Management, etc.) fully completed prior to work starting.

The only acceptable option is to have a fully integrated Traffic Management Plan, sealed by an appropriate professional when so required by the contract.

In limited circumstances, such a plan may be specific to a particular portion of the work, allowing work to commence. This does not, however, remove the obligation to provide the full plan covering the rest of the site.

9. **The Traffic Management Plan has been accepted and implemented. You observe that the implemented plan is not working when you observe many motorists speeding through the jobsite, many near miss traffic incidents and several complaints from the public regarding sign confusion.**

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

Public safety

Diver expectancy

Contractual Requirements

Provide safe passage through the site and ensure safety of the workers (SS 194.01)

Risk Assessment/Process:

Contractor, usually through the Traffic Control Supervisor, assesses the effectiveness of the traffic control measure put in place and makes any modifications necessary

Ministry Representative reviews proposed changes, offers suggestions or states requirements, and accepts the final measures

If the Contractor does not take sufficient measures, the Ministry Representative should issue a Stop Work Order and immediately take control of the site to ensure the safety of all parties

Roles:

Contractor is responsible for the operation of the site

Ministry Representative accepts Traffic Management Plan and does due diligence on its operation

Ultimately, the Ministry Representative is charged with taking whatever measures are necessary to protect the public and others traveling through the Site.

Best Practice: Discussion & Solution:

The Contractor must continually assess the effectiveness of traffic control and make necessary adjustments to safeguard the public and the workers. The basis of the Traffic Management Plan is from the guidelines and may require site specific modifications.

It is the responsibility of the Contractor to provide safe passage through the worksite.

If the traffic control is not working, bring this matter to the attention of the Contractor—in writing. If the matter is not addressed in a reasonable amount of time, issue Stop Work Order.

If necessary, the entire plan must be rewritten to address the actual circumstances encountered.

Possible technical solutions are:

- ensure the zone is as short as possible, to provide immediate visual clues to the drivers of the need to slow down
- to shorten the zone, clearly providing visual clues for the drivers that there is a need for them to slow down
- use portable speed bumps
- reevaluate the signing in accordance with Traffic Management Plan and current conditions

- use centerline and fog-line cones, progressively narrowing to provide psychological pressure to slow down.
- space cones progressively closer in a longitudinal direction
- request additional police enforcement

10. The results of 7-day compressive strength tests from a bridge concrete footing indicate that the concrete may not achieve the specified 28-day strength. The Contractor is continuing to use this concrete mix design for the remainder of the substructure concrete. Another major concrete pour is scheduled for tomorrow.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

Quality Control

Contractual Requirements

Quality Control Special Provisions

Risk Assessment/Process:

The Contractor assesses the testing results, what they indicate with respect to future similar work, and the associated risks, proactively ensuring that non-conformances are avoided

Ministry Representative does the same thing, in an advisory role

Roles:

Contractor is responsible for Quality Control and continual improvement

Ministry Representative is responsible to ensure that the Contractor produces a product that will meet long-term performance expectations

Best Practice: Discussion & Solution:

The Ministry Representative should advise the Contractor of the concern, perhaps in writing. It would be prudent for the Contractor to advise the concrete supplier of the concern and request data from the supplier to assess whether this is a normal trend for the mix design being used. If this is not a normal trend, then further review should be done to assess possible reasons for the low 7-day strength.

The Ministry Representative and the Contractor should meet and discuss the risks and any mitigation actions that could be taken to ensure that problems do not arise.

If the Ministry Representative believes that there are potentially serious problems with continuing with this concrete mix design, then a Stop Work Order could be issued.

11. The bridge specifications require that all welding be done by welders that are qualified by the Canadian Welders Board. The Ministry Representative discovers that the welding of the steel pipe piles to the precast concrete cap beams at the abutments has been done by a welder that was not qualified by the Canadian Welders Board. This welder is now doing similar welding at the piers.

- What should the Ministry Representative do?

Issue

Certification of personnel

Contractual Requirements

Welders must be certified by Canadian Welders Board (SPs)

Risk Assessment/Process:

Contractor must review qualifications of workers to ensure compliance with specifications

For the subject welds, the Contractor must assess means of either confirming the quality of the welds or redoing them

Ministry Representative, in conjunction with the Ministry's Regional Bridge Engineer or other technical experts, will assess the Contractor's proposed actions and approve or reject them

Roles:

Contractor is responsible for ensuring compliance with specifications, and developing and implementing remedial actions

Ministry Representative coordinates the internal review of the remedial measures and provides the Contractor with the approval

Best Practice: Discussion & Solution:

The welding is non-compliant with the contract and cannot be accepted. This should have been detected and corrected under the Contractor's Quality Control Plan.

The Contractor must be advised in writing that the welder's qualifications, and therefore the welds, do not meet the contract requirements and are unacceptable and that no further work is to be done by the welder. The onus will then be on the Contractor to determine what to do to make the welds compliant.

If appropriate, the quality of the welds may be verified using techniques such as x-raying or magnafluxing, coupon tests, etc. which could allow the welds to be accepted. However, good welds do not fulfill the welder certification requirement and the welder cannot be allowed to continue.

The Contractor's plan to address the issue must be acceptable to the Ministry Regional Bridge Rehabilitation/Construction Engineer.

ENVIRONMENT



C) Environment Breakout Session

1. In July 2004, within the Fisheries Window, construction is occurring on a culvert approved by Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection. Before the culvert is installed, survey and layout are done and it is evident that the culvert inlet and outlet inverts are 0.6 m above the streambed.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

The primary issue is fish passage required under Section 20 of the federal Fisheries Act and is likely a design glitch. If the stream is fish-bearing, the culvert elevations must be adjusted to maintain upstream fish passage (i.e., not perched above the streambed), to comply with requirements under the Federal Fisheries Act and provincial Water Act Regulation. An environmental design specialist must confirm the design changes and the information should be relayed to the regulatory agencies.

Contractual Requirements

An unauthorized scope change has occurred by the engineering designer

Risk Assessment/ Process:

If the new design is followed, charges under the Fisheries Act will likely be pressed. The design change requires clarification leading to a new design such that the invert is imbedded below the streambed elevation. Engineering design should confirm with the Environmental Manager.

Roles:

The Ministry Representative should discuss the situation with all parties to redesign; including Department of Fisheries and Oceans, Ministry of Water, Land and Air Protection, etc. The Ministry Representative should sign-off on the final design. It is the responsibility of the Contractor to inform the Environmental Monitor and Ministry Representative of the change. Work must be halted until sign-off by the Ministry Representative

Best Practice: Discussion & Solution:

Simply installing the culvert with the inverts at the streambed elevation may not be adequate. Typically, culvert installations on fish-bearing streams require the inverts embedded below the streambed elevation to provide a more natural substrate within the culvert, accommodate possible downstream channel changes and to allow natural downstream gravel recruitment.

In rare instances, an elevated culvert could be the design specifications (e.g., to impound water upstream of the roadway to create a wetland or for water storage, to prevent undesirable fish species from moving into upstream reaches). Therefore, it is imperative that the design be confirmed with an appropriate environmental specialist that is familiar with the intent of the culvert design.

2. The contract specifications do not allow burning of wood waste and indicates the wood waste must be chipped and be no greater than 30% of the volume of an unsuitable materials disposal site. Although there is no indication on the plans, during construction Department of Fisheries and Oceans requests that stumps and other woody debris be placed in some of the local salmon streams to provide habitat complexity. In addition, Ministry of Water, Land and Air Protection requests woody debris placements in terrestrial areas as small wildlife habitat on the right-of-way.
 - What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Issue

The primary issue is one of an additional discretionary request by Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection for added enhancement measures that may impact the budget and schedule.

Contractual Requirements

Generally, no burning of slash is allowed and chipping will be expensive. Therefore, a change order should be investigated as this may have environmental benefits.

Risk Assessment /Process:

There may be a claim by the Contractor. Long term environmental liability associated with placement of woody debris in the stream may occur (flooding risk etc.). Confirm with Ministry Representative and Environmental Monitor the regulatory approval (i.e. Section 9 and Fisheries Authorizations) conditions. Confirm costing with the Contractor.

Roles:

Department of Fisheries and Oceans/Ministry of Water, Land and Air Protection to obtain and justify need to Ministry Representative and Environmental Monitor (seek approval) prior to discussion with Contractor—Ministry Representative to approve

Best Practice: Discussion & Solution:

As described below, this may be something that is considered worthwhile to do.

If such work had been previously contemplated, there is likely a Provisional Sum Item to address it. If so, the planned work must be agreed to by the Ministry (this could be the Ministry Representative alone, if so empowered, but is more likely to be made in consultation with the Project Manager, the Environmental Monitor and the Construction Manager).

If it was outside the scope of the project, the Project Manager must also approve the additional funds.

While this might not be in the design, judicious placement of woody debris in instream and terrestrial habitat areas is a common practice to provide habitat complexity. Also, it is often more inexpensive than other wood disposal methods and builds goodwill with the regulatory agencies and environmental stewardship groups.

Placement must be done under proper environmental design, controls and direction because too much wood could cause fish habitat violations or harm terrestrial habitat areas (e.g., woody debris placed instream that is dirty or causes erosion, placing wood on top of rare plant species) and use of heavy equipment near streams has to be done in accordance with environmental protocols.

Sometimes instream wood placement requires anchoring to ensure it remains in place and is not swept downstream. Appropriate technical specialists must be consulted to confirm that the proposed woody debris placement is desirable, and written confirmation from the environmental agencies is strongly encouraged.

In many scenarios, it is environmentally desirable to use woody debris to enhance habitat areas. However, some of it may still require chipping and/or mixing into unsuitable material disposal sites.

Opportunistic, cost-effective environmental enhancements generate goodwill benefits between agencies and community environmental groups and should be considered if practical.

-
3. **In May 2003, a streamkeeper group has contacted the media and project staff complaining about siltation and poor environmental construction practices on a highway construction project. The Contractor is working to the environmental requirements in the contract documents, Standard Specifications, regulatory approvals and Best Management Practices. You observed that after some recent rainstorms turbid runoff is coming from an upstream active logging operation. The same streamkeeper group contacts you and says they are working on a fish enhancement project with Department of Fisheries and Oceans and would appreciate any extra construction materials for their project (e.g., filter cloth, seed mix).**
- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

The primary issue is stakeholder relations and due diligence. In this case, the perception is the project is causing siltation in a streamcourse. The secondary issue is a request for provision of materials for an enhancement opportunity.

Contractual Requirements

Department of Fisheries and Oceans requires that suspended sediment in streams do not exceed background levels significantly for any construction project. In addition, there may be municipal bylaws related to suspended sediment. The significance of the exceedance varies from region to region. Generally, within Ministry of Transportation specifications, these exceedances are specified and it is the Contractor's responsibility within the contract to observe these specifications.

Risk Assessment/ Process:

The stakeholder or public comments and complaints to Department of Fisheries and Oceans will result in sampling and potentially, charges being laid. By working with local stakeholders and having them review the work in addition to providing material and support for enhancement opportunities, will result in a positive perspective.

Roles:

It is the Contractor's responsibility to ensure no siltation occurs. Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection should be contacted to pursue the source of the sedimentation. The Environmental Monitor and Ministry Representative should be informed to ensure legally defensible sampling is undertaken to determine the sediment source. Due diligence should be exercised by all.

Best Practice: Discussion & Solution:

Public or other perceptions of construction activities are often incorrect. The opportunity to clarify the diligent environmental efforts of the construction project should be made to the streamkeeper group. You can point out to them your observations. Unless you are certain that the logging activities are the source of the problem, it is prudent to allow someone else to follow up on the issue (i.e., Department of Fisheries and Oceans and/or Ministry of Water, Land and Air Protection), rather than pointing fingers. No developer, including road construction or forestry, wants to be the subject of false accusations.

If the Contractor has some surplus materials available and can be provided to the streamkeepers (or other non-profit environmental society) for an environmental enhancement project, it is a good way to build a positive relationship with them.

-
4. **It is mid-summer and the Contractor has approached the Ministry Representative regarding a local farmer's small borrow site, which he said could be used for the active highway construction if the drainage ditch in the farmers field is cleaned by the construction Contractor. The ditch has about 15-30 cm of water depth and is overgrown with grasses and weeds. Using the farmer's granular materials will be a good cost and time savings of which the Contractor is willing to share the savings, compared to the granular source identified in the contract.**

- **As a Ministry Representative, what would you do?**

Issue

The primary issue is potential contravention of the Fisheries Act. Watercourses that appear to be strictly drainage ditches sometimes support fish and/or were originally channelized streams. Diligence must be exercised to determine if this is the case prior to doing any work.

If fish are not captured during a sampling event, they could still use it during other seasons. For example, areas that dry or become warm in the summer may not have any fish during the warm season, but may support fish during wetter and/or cooler periods. Seasonal sampling and a proper Fisheries assessment is generally required to determine fish habitat, not necessarily just a single sampling event.

Contractual Requirements

Section 9 Notifications are generally not required for work in non-natural watercourses that are used strictly for drainage management, such as man-made ditches. However, if the watercourse is a channelized stream, a Section 9 Notification is required.

Risk Assessment/ Process:

If fish utilize a watercourse, whether it is natural or man-made, it is considered fish habitat and it is a violation to do any work in it without approvals from both Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection. Thus it is the Contractor's responsibility to ensure changes in work scope do not result in potential charges under the Fisheries Act or other environmental legislation. The Environmental Monitor and the Ministry Representative should be informed of scope changes.

If you can confirm that the ditch does not have any environmental issues, it might be worth considering the farmer's offer. If the ditch has Fisheries or other environmental concerns, you should thank the farmer, explain your concerns and turn down his offer.

Roles:

The Ministry Representative must require the Contractor to provide evidence that Agricultural Land Commission, environmental, Department of Fisheries and Oceans, etc. approvals, are in place. If not, the Ministry Representative should refuse to allow the work to proceed. It is the responsibility of the Contractor to notify the Environmental Monitor and Ministry Representative of changes to work scope.

Best Practice: Discussion & Solution:

The Best Management Practice therefore is to immediately contact the Ministry Representative and Environmental Monitor to ensure proper due diligence has been exercised.

-
5. **You have a one month Fisheries "window" and it starts within two weeks of mobilization in the rural section. One month is not enough time to get the work done given the "available equipment."**

- **As the Ministry Representative, how do you proceed to solve this, and through whom?**

Issue

The primary issue is the Ministry of Transportation delay of the award/tender has not allowed sufficient time to work within the Fisheries window. A potential secondary issue is that the Contractor may not be allocating enough time/materials to complete the work in a timely manner.

Contractual Requirements

Contractually, the Contractor must provide sufficient equipment to perform the work within the allocated time. They should mobilize as quickly as possible to ensure that they can make full use of the allotted time, and may consider double shifting.

Risk Assessment/ Process:

If the Contractor proceeds to work outside the window, charges under the Fisheries Act could be laid. The Contractor should contact the Ministry Representative and Environmental Monitor regarding acquisition of a Fisheries

window extension AFTER alternate methods have been explored to meet the window requirements.

Roles:

The Ministry Representative and Environmental Monitor are responsible for contacting Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection regarding window extensions. Changes in work scope that effect environmentally sensitive areas should be signed off by the Ministry Representative and Environmental Monitor.

At the end of the day, this is the Contractor's responsibility.

Best Practice: Discussion & Solution:

A variety of solutions may be available however the regulatory agencies require all reasonable and possible technical/procedural solutions be explored and rationalized prior to granting an extension. Double or triple shifting is a typical Best Management Practice.

6. You discover the Contractor has made a private deal with a local landowner/farmer next to the grading area for dumping of waste and stripping instead of trucking it 5 km to the approved waste site.

- As the Ministry Representative, what do you do?
 - Turn a blind eye to this;
 - Ask for \$ back on the basis of savings to the Contractor;
 - Shut it down because it is non-conforming.
- What else should you do to ensure there is no risk to the Ministry?
- What else should you do to ensure that the deal is okay contractually?

Issue

The primary issue is a variance to the contract and potential contravention of the Soil Conservation Act, Contaminated Sites Regulation and other environmental regulations.

Contractual Requirements

As this is a variance, this will most likely not be allowed under the terms of the contract.

Risk Assessment/ Process:

A contravention of various environmental regulations may occur if allowed to proceed. In particular, the Contaminated Sites Regulations prohibit transport of contaminated soils without permits and the liability may fall back to the owner (polluter pays principle). In addition, fire hazards may be created if woodwaste is present.

The Contractor should contact the Ministry Representative and Environmental Monitor to obtain appropriate permits, if required.

Roles:

The Contractor is responsible to ensure that waste is going to a legally designated landfill. The Ministry Representative and Environmental Monitor are responsible for regulatory contact/permits if a work scope change is proposed.

Best Practice: Discussion & Solution:

Formerly under the Soil Conservation Act, approvals were required from the Agricultural Land Commission and Regional District to dispose of materials on Agricultural Land Reserve lands. This process used to take a minimum of six months. It now requires approvals under the Agricultural Land Commission Act, who require at least 60 days notice and may impose specific conditions for the placement of fill.

The Ministry Representative must require the Contractor to provide evidence that Agricultural Land Commission, environmental, Department of Fisheries and Oceans etc., are in place. If not, the Ministry Representative should refuse to allow the work to proceed. This would be acceptable if all permits/approvals are obtained in a diligent manner.

-
7. **The Environmental Construction Monitor reports that a piece of equipment is illegally working in the creek. He says he told them to “Stop Work” but was told to “buy a candy”. He comes to you for your support.**
- **As the Ministry Representative, what do you do?**
 - Support the monitor and stop the activity;
 - Get the monitor to call the environmental agencies;
 - Bring the Contractor and the agencies together to discuss the issue;
 - Delay payment over the issue
 - **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

The primary issue is illegal instream activity by equipment in a stream (contravention of the Fisheries Act).

Contractual Requirements

Generally, Ministry of Transportation contractual requirements include a provision for stopping work under the Environmental Monitor’s orders.

Risk Assessment/ Process:

Charges under Section 35 and 36 of the federal Fisheries Act may be pressed by Department of Fisheries and Oceans. As the Environmental Monitor’s instructions have been ignored, further environmental violations may have occurred or continue to occur. The liability may be reflected on the owner and certainly the Contractor and equipment operator.

The Environmental Monitor should immediately contact the Ministry Representative as per above.

Roles:

The Environmental Monitor is responsible for reporting all such actions and taking steps to prevent environmental harm. The Contractor is responsible for implementing the Environmental Monitor's suggestions.

Business Practice: Discussion & Solution:

The Best Management Practice would be for the Environmental Monitor to issue a Stop Work Order on the activity. A meeting should be called between the Contractor, Ministry Representative and Environmental Monitor to resolve difficulties. Illegal instream work will not be tolerated and must be stopped immediately. The Ministry Representative enforces to the Contractor that the Environmental Monitor has stop work order authority on these issues. All the above items are appropriate responses.

-
8. **A Fisheries Officer visits the site and sees equipment working in-stream illegally. He orders a cease work directive, takes samples and “reads you and the Contractor superintendent your rights”.**

- **As the Ministry Representative, what do you do?**

Issue

The primary issue is the laying of charges under the Fisheries Act for illegal instream work. Specifically contravention of Section 35 and 36 of the Fisheries Act

Contractual Requirements

Generally, Ministry of Transportation contractual requirements include a provision for working within specific Fisheries work windows and provision of a full time Environmental Monitor for instream works. These most likely have been contravened. The Contractor is required to fulfill these obligations.

If the Contractor was doing the illegal work without the Ministry's endorsement or knowledge, and in violation of the contract documents or environmental approvals, a payment holdback could be pursued and the Contractor could be held liable for costs of remedial efforts or charges.

Risk Assessment/ Process

Charges under the Fisheries Act are a serious offence with fines up to \$1,000,000 (CDN) per day. A stop work directive generally indicates Department of Fisheries and Oceans considers a violation has occurred and may be obligated to investigate. An investigation can lead to charges. While under investigation, an owner may also be named and restrictions put on the completion of further work on-site, not just the specific activity (i.e. the entire work site shut-down).

The illegal instream work must be stopped immediately and the Ministry Representative should emphasize to the superintendent that only instream work done in accordance with approvals is permitted. The only possible exception is under “emergency” circumstances (e.g., imminent threat to human life or property). Even under emergencies, due diligence must be maintained, which includes advising the agencies of work and requesting their approvals/feedback, retaining a qualified Environmental Monitor and operating under environmental Best Management Practices wherever possible.

You should ensure that an accurate reflection of the situation is recorded in your notes made at the time of the incident, take representative photos and collect your own samples if possible. Samples should be collected by a qualified person, done in accordance with legal and scientific protocols and with proper chain-of-custody in the event the information is entered into a court proceeding.

The Environmental Monitor and appropriate project staff should be notified immediately, including the Ministry of Transportation Regional Environmental Manager, or if unavailable, the Chief Environmental Officer.

Roles:

The illegal work is subject to charges under the Fisheries Act and Water Act. Based on the evidence and circumstances, the agencies may choose to charge the Ministry, the Contractor and/or negligent individuals.

The Contractor is responsible for remediation of any damage caused by the incident under the direction of the Ministry Representative and Environmental Monitor.

Best Practices: Discussion & Solution:

Determining required remedial or mitigation efforts should be done as soon as practical in collaboration with the agencies. If necessary, technical experts should be retained to support remedial efforts. This will help to maintain due diligence and could positively influence the outcome of the investigation and potential legal proceedings. In addition, legal sampling should be undertaken as well as other documentation of the incident.

All this should be addressed through the Quality Management Plan.

-
9. **Your paving Subcontractor is about to mobilize on grade that has been built two months ago. Weather is dry and clear. Near the swamp, you notice a few frogs along the grade one day and the next day thousands are all over the grade and up and down the ditchlines along a 500 m stretch. They seem to be moving across the grade toward the swamp that is 450 m away.**
- **As the Ministry Representative, what will you ask the Contractor to do and how will you deal with this situation?**
 - **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Issue

The primary issue is potential contravention of the provincial Wildlife Act or in certain circumstances, the new federal Species at Risk Act. Secondary issues include potential impacts to project scope including budget and schedule.

Contractual Requirements

In order to address the situation, an Extension of Time may be required from Ministry of Transportation. This is not cause for a Reimbursable Delay. Any changes in the contract would be dealt with under the contractual provisions for changes to drawings and specifications.

Risk Assessment/Process

There is a risk that if paving proceeds, damage to wildlife may occur and contravene the Wildlife and Species at Risk Acts.

Roles:

Wildlife migrations can be high profile events and as such it is important for the Contractor to immediately notify the Environmental Monitor. The Environmental Monitor will ascertain the significance of the event both on short term impacts to the project that may result in extensions being granted and longer term implications that may result in design/ scope changes. Most likely the Environmental Monitor will contact a regulatory (Ministry of Water, Land and Air Protection or Environment Canada) agency for advice.

Business Process: Discussion & Solutions:

Situations occur where unanticipated migrations of wildlife or returns of fish occur at construction areas or streams. It is critical that immediate action is taken to meet environmental legislation and to try to avoid construction delays and claims. Technical support from the project team will be required to develop a mitigation strategy and liaise with the agencies.

It is best to work cooperatively with agencies to mitigate the issue because doing nothing or ignoring environmental requirements will only create more conflict and require more detailed and costly pre-construction environmental assessments for future projects. A little give-and-take hopefully works both ways between the proponent and the agencies.

Involving all relevant parties to try work out a solution that mitigates the environmental issue and allows construction to proceed on schedule is the goal. Typical short-term Best Management Practice for this type of event includes stopping work to allow the migration to pass, salvaging and moving wildlife to the destination. Longer term Best Management Practice includes design changes to accommodate the wildlife movement corridor such as tunnels and creating collection points using drift fencing and pitfall traps for ongoing salvage.

-
10. **You discover you do not have a signed Fisheries authorization from Department of Fisheries and Oceans just as the Contractor is to start his instream work.**
- **As the Ministry Representative, how would you deal with this to prevent a claim by the Contractor?**

Issue

The primary issue is contravention of the federal Fisheries Act

Contractual Requirements

Quality Management should have identified this. A reimbursable delay may be issued.

Risk Assessment/ Process:

If work proceeds without a Fisheries authorization, a charge under the Fisheries Act may be laid.

Ensure that no work is done instream until the authorization is in place.

The Ministry, supported by the Contractor, should contact Department of Fisheries and Oceans to follow up on the permit status.

Roles:

The Ministry Representative is responsible for ensuring required permits and authorizations are in place. The Environmental Monitor is responsible that conditions of the permits and authorizations are adhered to by Contractors. Contractors are responsible for being aware of these conditions and following direction of the Environmental Monitor.

Best Practice: Discussion & Solution:

Develop a work strategy, so the anticipated procedures can be clearly laid out for the approval agencies to assess.

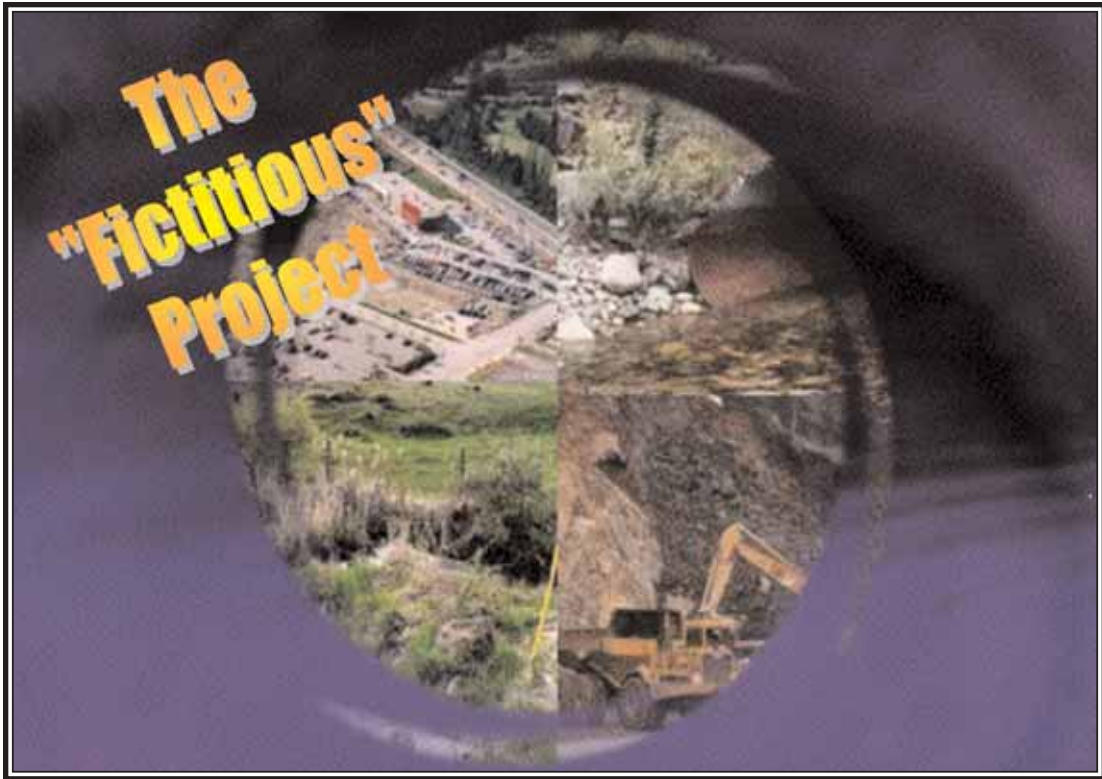
Undertake an existing conditions survey of the site—if there are no fish species currently in the stream, that assessment may aid the approval agencies in reaching a speedy conclusion.

If obtaining the authorization is the responsibility of the Ministry, this is a clear cause of Reimbursable Delay, and the common practices must be followed.

APPENDICES

Appendix A

Project Information Summary



Project Information

Project Location: Highway #0, 7 km of 4-lane highway, start in Timbucktoo, crossing over Coho Creek, and extending north to Timbuckthree

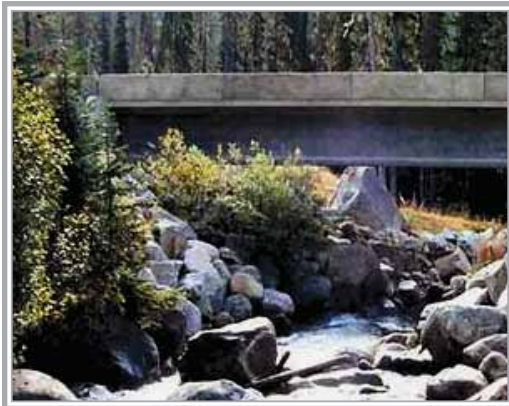
- Tendered in March 2004
- Awarded April 1, 2004 to Warm & Fuzzy Construction, a joint venture
- Completion Date is October 31, 2005

The Project consists of three characteristic areas:

- Urban: Reconstruction of 3 km of 2 lane highway to 4 lane arterial design standard
- Stream Crossing: Construction of a 30 m single span, concrete girder bridge on piles
- Rural: New construction of 4.5 km of a 4 lane rural design standard through mountainous and wetlands areas

Urban Section

- Many small business and residential accesses
- Some owners are vocal and politically connected
- A new multi “big box” development adjacent to site is almost complete; it fronts on 1 km of the Highway
- Many property takings are involved: some not completed yet; some based on an old design
- Utilities within the corridor are: hydro, telephone, gas, cable, Municipal sewer & Regional District water main
- 15,000 vehicles per day through the site
- Design lowers existing grade by 1 m throughout much of the length



Coho Creek Bridge

- 30 m single span, concrete girder bridge on piles to replace a temporary culvert
- Significant riprap work required

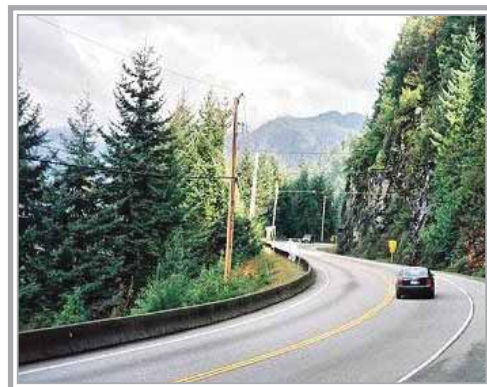


Coho Creek & Wetlands

- Coho Creek and the associated wetlands are fish-bearing and this is anticipated to be a record year for spawning
- Coho Creek has been utilized by aboriginal people as a food source for centuries
- Archeological study was done for an earlier bridge in 1950.
- Fisheries Window is July 1st to July 31st.

Rural Section

- Large rock cut
- New alignment crosses wetlands area
- Environmental Window requires fills to be built to subgrade by Oct 31, 2004



Time Lines

- Awarded on April 1, 2004
- Completion Date October 31, 2005
- Fisheries Window is July 1st to July 31st.
- Complete urban section km 2 to km 3 by May 31, 2004
- Bridge built and removed by September 15, 2004
- All embankments to sub grade by October 31, 2004
- Bottom lift paving of 2 lanes by October 31, 2004
- Complete all paving by July 1, 2005

Quantities

The quantities should not be an issue with any of the problems posed but, to give you a scale of the project, key quantities are:

- Type A: 190,000 m³
- Type D: 75,000 m³
- 600 Ø pipe piles : 200 m
- Paving: 35,000 t
- Municipal: 2,000 m each of sanitary, storm and water
- Utilities: 100 pole moves; 7,000 sheath metres telephone and cable

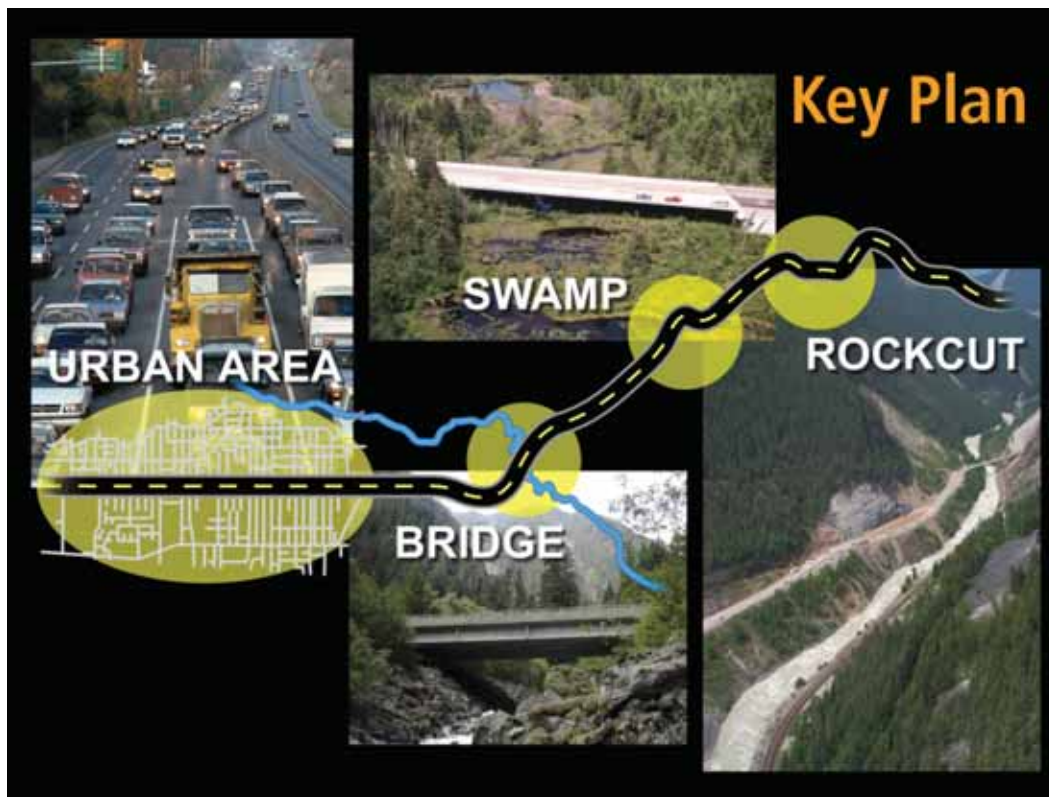
Issues

You may encounter the following and other issues:

- Timelines are tight
- Changed conditions
- Design revisions
- Environmental and Fisheries windows affect the work
- Third parties have strong interests in the project: developers, owners, businesses, an Indian Band, environmental groups, Utilities, etc.
- The relationship between Warm & Fuzzy and the Ministry Representative has been good so far, but...

Issue Resolution

- The questions you will be given provide additional facts about specific aspects of the project
- All issues require resolution by the Contractor, the Ministry Representative, or by both, and may also involve 3rd parties
- This is a construction contract, so each party would be expected to substantially meet their contractual obligations
- Just as in the real world, each party would also be expected to promote and protect their own interests
- All issues should be approached in a “partnering” fashion
- Consistent methodologies of resolution should be used and consistent results obtained



Appendix B

Breakout Session Questions

Section A – Authority Breakout Session

Question 1:

The Contractor has approached you saying he is planning to start some work prior to the preconstruction meeting.

- a) What issues could arise as a result, and what actions should each party take to ensure a quick, coordinated and appropriate response?
- b) Who has the authority to allow the Contractor to start?

Table 1

Part a

- Formal award, insurance in place
- Notice of project
- Risks and assessments
- Type of work?
- Safety, traffic control, environment plans in place?
- Identify issues and impact
- Property acquisition in place?
- Site supervisor and safety persons on-site
- Quality Management plan accepted
- Identify need to start early

Part b

- Authority—involve Project Manager
- Handle request diplomatically

Table 2

Part a

- Consultant Ministry Representative
- Are traffic plans in place?
- Are environmental plans in place?
- Communications plan—public notifications
- Is bonding and insurance in place?
- Are there permits?
- Impact on utilities
- Are lines of communication in place?
- Schedule of work
- Schedule an on-site meeting to look at the specific work assuming bonding etc. in place as above

Part b

- Project Manager has the authority
- Ministry Representative should be involved
- Project Manager would issue in writing a Stop Work Order

Table 3**Part a**

- Small meeting on-site to identify work to be done
- Identify show stoppers
- All submissions for work to be provided bonding and insurance Notice of Project
- Signed contract

Part b

- Ministry Representative in consultation with Construction Manager and Project Manager

Table 4

- Is Quality Control plan in place?
- Are schedules and permits in place?
- Are contract obligations met (bonds and insurance etc.)?
- Third party considerations
- Liability concerns

Table 5**Part a**

- Speed up the preconstruction meeting to meet Contractor needs
- Is there a signed contract?
- Insurance, permits, bonds?
- Properties settlement
- Teams not met yet
- Safety issues—Site Safety Plan
- Quality Control Plan in place
- Safety plan
- Confidentiality of documents—professional integrity of Ministry Representative
- Who attends meetings?
- Partnership meetings first

Part b

- Ministry Representative has authority

Table 6

- Contract signed required?
- Bring documents to Ministry Representative—Insurance and Bonds
- Takes time to organize preconstruction meeting
- Preconstruction should be set up as soon as possible
- Process can be streamlined by reducing the paperwork once Contractor/Ministry of Transportation and Consultant agree

Table 7

- Bonding and insurance must be in place
- Traffic Control Plan, Quality Control Plan
- Contractor may want to start
- Preliminary layout may want to start
- Cleaning
- Crushing
- Issues: boundary of clearing
- Ministry Representative has the authority to allow Contractor to start

Table 8

- Have in place: Preconstruction meeting, Traffic Management Plan, schedule, Sediment Drainage Management Plan, bonds and insurance
- Is contract signed?
- Formal contract must be in place
- Proper authorization signed by both parties
- Consult with Project Manager
- Have meeting with all parties, determine extent of work proposed
- Check procedures involved with proposed actions
- Work at approvals for traffic etc. prior to start up

Question 2:

The Contractor plans on continuing with his detour work in the 1 km section, but will be held up unless Telus can move their lines and poles by Monday next.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 1

- Who is responsible for coordination?
Contractor and Ministry Representative meet with Telus
- Discuss partnership with two parties
- History on what has transpired prior to delay
- 3-way meeting; Ministry Representative mediating?
- Alternate ways of doing the work. Working around the delay
- Preconstruction meeting, explore the commitment by the utility company
- Is detour in contract or generated by prime Contractor
- IF NOT RESOLVED: reimbursable delay, extension of time if Telus is responsible
- Possible cost sharing to bring in a third party
- Possible cost sharing by Ministry Representative and Contractor for Telus working extra time to do the work
- Involve “proper” Telus personnel to try and resolve the issue quickly

Table 2

- Ministry Representative needs Contractor’s ability to coordinate the utilities
 - (some do not feel this is the Contractor’s problem)

- Why is there a problem? —Identify the problem
- Look for an alternate route (higher up the chain)
- Notify Ministry Representative of schedule changes
- Do everything possible to assist Telus
- Advise Project Manager of potential impact

Table 3

- Ministry Representative and Contractor to discuss with Telus
- Find out when poles can be moved
- Contractor has to mitigate costs
- Contractor to look for other work for crew
- Ministry Representative to work with Contractor to mitigate the schedule
- Ministry Representative should look ahead and communicate with Contractor about future Utility moves

Table 4

- Someone notify Telus
- Who is responsible for communicating with Telus
- Consider alternate plans or options
- Is it going to cost more? How to reduce impact?
- Ministry Representative can suggest options
- Monitor cost impact

Table 5

- Who is responsible for coordination?
- Contractor, Ministry, Consultant-Protocol Agreement review
- Who coordinates and schedules the work?
- Everyone meet with all parties involved
- Contractor not empowered to deal with this
- Ministry trying to relocate utilities ahead of time
- Ministry Representative may consider project cost impact and deal with it
- Try to try everything in our powers to complete renovations to avoid costly alternatives

Table 6

- Important to get Ministry of Transportation working with all it can, to get utilities mobilized
- Ministry of Transportation must request Utility move or costs are much higher
- Contractor does not want to offer money to Utility to mobilize quicker
- Contact Utility during bid process but Utility usually will not give an answer to the Contractor

Table 7

- Contractor to have an alternate plan if Telus can not do the work in time
- Ministry Representative to check Special Provisions to see if work is guaranteed to be done by certain time by Telus

- Ministry Representative to setup meeting with Telus, Contractor and Ministry
- Get developer involved to put pressure on Telus
- Ministry Representative approaches Telus to work on weekend to carry out work

Table 8

- Ministry responsible for permanent utility moves as opposed to the Contractor paying for moves that he deems necessary to provide efficiencies in his type of work
- How do you motivate Utility to take action?
- Check prior commitments from preliminary design meeting scheduling of pole move
- Get on with work, motivate Telus to do the work
- Contractor and Ministry Representative to have past commitments well documented
- Involve Utility in partnering sessions
- Consider extension of time/reimbursable delay if Contractor has done everything to mitigate
- Minuted meeting of prior arrangements
- Work together to expedite solutions

Question 3:

The contract has overrun the stripping quantities by \$30,000.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**
- Who has the authority to approve the overrun?**
- Who has authority to approve the overrun if it is by \$115,000?**
- Who has authority to approve the overrun if it is by \$350,000?**

Table 1

Part a

- Balance of under run on Type “D”
- Excess may not overrun the total cost of the contract
- Getting designer involved—design change may be needed
- Weigh consequences if there are expected changes
- Team meetings to resolve and coordinate extra work
- Site meeting to resolve and coordinate extra work

Part b,c,d

- Authority:
- Project Manager: \$30,000
- Regional Director: \$115,000
- Assistant Deputy Minister: \$350,000

Table 2

Part a

- Ministry Representative to initiate justification for the overrun?
- Why is there a material problem or is the estimate wrong?
- Ministry Representative should initiate discussions for rate adjustments or unit price beyond 120% of item quantities
- Project Manager should issue a Supplemental Agreement for unit price change to reflect the additional work
- Ministry Representative discusses with Project Manager first after talking to Contractor
- Contractor must double check his quantities
- Resurvey the stripping quantity, Contractor may initiate the rate change

Table 3

- Renegotiation of price/Supplier Agreement
- Possible changes of conditions
- Approval = Construction Manager
- \$115,000 Regional Director
- \$350,000 Assistant Deputy Minister

Table 4

- \$30,000 Ministry Representative unless contract value exceeded then Project Manager
- \$150,000 Regional Director
- \$350,000 Assistant Deputy Minister
- Confirm why the overrun occurred
- Can it be offset by a reduction elsewhere?
- Obtain approval at appropriate level

Table 5

- Depends on the size of item and project size and total contract
- Why the overrun?
- Comes down to a signing authority for overage
- Common sense to process
- Blame surveyors, design engineers
- Approval process for the overrun
- The contract total is the important thing
- Quantity may be neutral upon further investigation compared to total contract
- Warning sign to check all items
- Forecast expenditure for future expenditures

Table 6

- Confusion still about hierarchy
- Ministry Representative ☐, Construction Manager ☐, Regional Director ☐

Table 7

- Ministry Representative gets authority from Construction Manager and Project Manager for extra costs if required
- Ministry Representative verifies that referral removed is within contract language
- Did \$30,000 affect major overrun or underrun?
- Ministry Representative verifies quantities
- Approval = Construction Manager
- \$115,000 Regional Director
- \$350,000 Assistant Deputy Minister

Table 8

- Have a pulse on daily quantity issues early on
- Assess effects on other quantities and costs to overall project budget
- Ministry Representative has authority if overall cost is not affected
 - Ministry Representative to \$25,000
 - Construction Manager/Project Manager to \$50,000
- Informed communication to track quantity issues
- Overrun issues and possible renegotiated unit price
- Does it affect the overall costs?
- Investigate possible design revisions depending on the circumstances which may mitigate overruns and possible contract value

Question 4

There are delays during the expropriation of a commercial property, which will impact the haul from the cut to the embankment. The Contractor requires this piece of property to complete the work according to their schedule.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 11

- Determine what impact there is to the project?
- Can we work around it? Can we schedule the change?
- Talk to stakeholders/deal with property owner
- Contractor to write letter to Ministry Representative
- Look at alternate haul routes/designs
- Keep communication routes open
- Call in specialists in to determine rock mass
- Safety issues to workers/public
- Contact local authorities

Table 14

- Talk to owner perhaps get access before sale (involve Property Agent)
- Contact Property Agent
- Construction estimate

- Contact Property Agent
- Change traffic plan to allow haul in traffic
- Mitigate any cost impacts
- Change haul, maybe compensate Contractor
- Design changes

Table 15

- Contractor: should work around to find alternate route/worksites
- Ministry Representative communicates to Project Manager/Construction Manager to get Property Agent
- What is the length?
- What is the delay?
- Contractor should find out about the extension of time, reimbursable delay, alternate haul routes
- Ministry Representative—sweeten the pot, change haul, use material elsewhere
- Cost impacts other impacts to schedule
- Adjust milestone

Table 17

- Notify Property Agent
- Minimize problem
- Issue on expropriation priority
- Ministry acknowledges responsibility of delay
- Reservations of starting and then stopping expropriation
- Record delays

Table 37

- Delays during expropriation
- Ministry is in process of appropriation
- Identify what the delay is?
- Meet with property owner, Ministry Representative and Contractor
- Can Contractor revise his schedule?
- Onsite meeting with Contractor

Table A

- Contractor delay
- Is it reimbursable?
- Clearly a case for reimbursable delay
- Perhaps there are options
- Can the problem be worked around and not impact either the owner or the Contractor?
- Can other work be done until the property is acquired?
- Work together to find a solution
- Solve the problem together
- Both parties should document the problem and solution

- Ministry Representative □, Construction Manager □, Property Agent □
- Property Agent may come up with a solution (i.e. license to construct prior to purchase)
- Ministry Representative □, Construction Manager □, Designer □, Geotech Engineer □,
 - perhaps a revision?
- If no solution is found:
 - Contractor and Ministry Representative document Contractor's cost to work around the problem
 - Accurate records
 - Other options could result in a change of scope of work
 - Contractor to ask for schedule extension
 - Ministry Representative □, Construction Manager □, Property Agent □

Table E

- Look for alternatives to haul route
- Revised schedule (change?)
- Discuss with Property Agent
- Future contract acceleration
- What are the impacts?
- Trade offs with property owner
- Construction Manager and Project Manager partner for joint solution

Table F

- The risk from a project perspective is that the Contractor will be entitled to reimbursable delay
- Call a partnering session and communicate the facts clearly to all parties
- Identify all the options
- What can we do to work around?
- Objective to mitigate the risk of reimbursable delay
- Find ways to keep Contractor's equipment going
- Look at design options
- Put pressure on land department
- Try to get license to construct across property

Question 5

The Contractor calls the Ministry Representative and says he cannot open the highway because the rock cut has a large rock mass he considers unsafe.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 11

- Call a specialist to determine rock mass
- Safety of workers/public
- Geotech/design called in

- Temporary measures to avoid delays
- Contact Ministry Representative and local authorities
- Ministry Representative calls meeting with geotech and stakeholders
- Come up with alternate route
- Set up permanent solution

Table 14

- Call in expert
- Temporary detour
- Remove rock slab
- Monitor

Table 15

- Contractor
 - Safety issue
 - Traffic Management Plan—notification
- Ministry Representative
 - Bring professional engineer, geotech, authority—District Manager, Transportation to close highway
 - Investigate

Table 17

- Get technical expertise
- Arrive at consensus of how to deal with problem
- Look at the big picture, closure of highway
- Repercussions of closure, notify District Manager, Transportation
- Risk assessment to be done
- Can rock mass be moved in a hurry
- High level issue
- Backup plan should have been in place prior
- Notify media/municipality

Table 37

- See what the technical solution is (Geotech Engineer)
- Notify district and regional offices and Maintenance Contractor
- Discuss the problem
- Contractor to consult with own blasting people
- Can traffic be detoured?
- Make sure site is safe
- Is there alternative work that can be done?
- Ministry Representative would be overseeing what the Contractor is doing

Table A

- Issue must be addressed immediately
- Confirm the situation

- Determine that it has to be closed
- Determine a course of action, inform others, act on it
- Weigh the risks, traffic flow vs. risk of injury
- Detour? Single lane? Spotter?
- Construct a catchment beam to contain rock fall. Remove loose rock
- Contractor and Ministry Representative must agree on action to take to resolve the problem
- Ministry Representative to inform District Manager, Transportation and Regional Director—authority to close the road
- Contractor to notify emergency contact people

Table D

- Call expert Geotech Engineer/specialist
- Detour options/emergency options
- Contractor pulling wool over eyes
- External stakeholders
- Public safety is paramount

Table E

- Meet Contractor immediately onsite
- Conduct own field inspection
- Confirm the position
- If matter of life and death then close immediately but Ministry Representative does not have authority to close road
- Call District Manager, Transportation who has authority and who would notify Regional Director
- Contractor would be responsible to uphold Incident Management Plan
- Set up spotter to see if any movement
- Go to single lane

Question 6

The bridge design drawings call for the installation of eight friction piles, 25 metres long, at the north abutment of Coho Creek Bridge. During the installation, bedrock is encountered at depths ranging from 5 to 15 metres at the four easterly piles.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 19

- Contractor to notify the Ministry Representative
- Ministry Representative notifies Structural Engineer, Construction Manager
- Have open communication about the changes, effects on the schedule
- Discuss if there is any other work which the Contractor can undertake
- What cost implications are there?

- Open and honest conversation about what can be done
- Ministry Representative to keep abreast of the time required for design change
- Ministry Representative to convey possible changes, Contractor to perform new work options
- Document men, equipment, materials delayed

Table B

- Consult with Ministry Representative and involved parties
- Contact geotech for specifications
- Get costs to minimize delays
- Bridge design cost involved for possible changes to the pile
- Testing of the bedrock
- Could possibly take 2-3 days
- Changes to the contract for all parties including the time schedules

Table C

- Change to geotech design, bridge designer to be consulted
- New design required
- Drill holes in rock
- Delays impact schedule down the road
- Ministry Representative may need to get extension for fishery window
- May change lots of items
- Revisit contract quantities and schedule

Table D

- Review Geotech Consultant report
- Bring all affected parties together for meeting to discuss
- Design Consultant to revise report and give recommendations as soon as possible
- Potential impact to Contractor/environment
- Costing for corrected measures and schedule
- Proper authorization to proceed

Question 7

In August 2004, the Contractor has submitted a girder erection scheme two weeks prior to the planned erection date. The drawings were submitted to the bridge design engineer for review. The bridge design engineer has stated that the erection procedure is incomplete and that there are concerns with the procedure that need to be addressed. The Contractor does not agree with the review comments and has stated that they will proceed with the erection tomorrow as planned.

- **As the Ministry Representative, what would you do?**

Table D

- Written notification to Contractor not to proceed if concerned
- Immediate meeting with all involved parties to resolve
- Written notification to proceed

Table 19

- Ministry Representative and Contractor to discuss
- If Contractor won't back with erection, issue a letter directing Contractor not to erect
- Ministry Representative to arrange a meeting between the engineers
- If a resolution can be made ministry will determine the requirements and the Contractor must follow
- Do the work claim later
- Ministry Representative to document equipment idle, moves and personnel affected

Table B

- Ministry Representative to first write a letter to the Contractor stopping work until a resolution can be accomplished
- Get the engineer, Contractor, Ministry Representative to go over the issues that concern the design
- The stop work order would be issued by the Ministry Representative just for that specific item
- If the Contractor disagrees with the Ministry Representative engineering, the Contractor may redesign to continue on with the work and claim for extras at the end of the project
- There is a possibility of the Bridge Engineer from the Ministry Representative and the Contractor may have different opinions or views on the design.

Table C

- Contractor must not proceed with the work
- Ministry and Contractor's engineers to meet
- Ministry may issue Stop Work Order
- Work together to solve problems

Question 8

During October 2003, the Paving Subcontractor says to the Ministry Representative, "It's too cold to pave". The Subcontractor is not prepared to pave bottom lift under these conditions even though this will mean he does not meet his milestone date. It is late in the season and it is unlikely that the paving will be completed until the following spring.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 28

- Ministry to check possibility to pave in the spring
- Get support from "expert"
- Get letter from Contractor stating his claim
- Regularly review schedule of Contractor to attempt to foresee the potential of the problem

Table 29

- Get all parties together to discuss circumstances
- Whose responsibility is it? Contractor, Ministry of Transportation or joint
- Is there an operational requirement to get it paved?
- Is there a safety requirement?
- What are the Contractor's options, additional rollers, heaters etc?
- If joined, negotiate prices and/or relaxed specs, joint cost share
- Schedule should be monitored for adherence and dealt with to ensure it is maintained

Table 30

- Develop a formal process of meetings and address scope in schedule by continuous meetings
- Key is to build a schedule so no surprises
- Need to have a full understanding what milestones Ministry has prior to construction
- Full disclosure will get buy in from all stakeholders
- Have all decision makers present at meetings
- Plan A: Don't Pave
- Plan B: Pave and repair in spring but it would already be reviewed

Table 31

- Who's risk?
- Schedule/cost/penalties/weather/grade
- Work out a deal to seal surface and pave and deal with results in spring
- Find out impacts of not paving. Costs/road surface
- Review milestone dates
- Discuss ramifications if not met with Project Manager
- Contingencies
- Cost and time
- Identify cost risks with not paving
- Work out deal to assign risk based contract responsibility
- Review circumstances to assign risk
- Meeting to define all facts and present to Project Manager

Table 34

- Check specifications. What is too cold?
- Check schedule—What can be done?
- Investigate and make informed decision
- Decision made by Ministry of Transportation, Contractor, and Project Manager

Table 32

- Quantity left to go
- Location of paving
- Was Subcontractor delayed by Contractor or others?

- Schedule delay done either by Ministry of Transportation or Contractor
- Penalties to be imposed?
- Article 9 impact
- Maintenance issues for shutdown
- Remediation plan required if beyond schedule
- Subcontractor consult Contractor for compensation if delayed by Contractor's work
- Contractor
 - Stop work would incur maintenance/traffic/safety to public travel
 - Pickup costs or cost share between Ministry of Transportation and Contractor
- Divide costs for shutdown and startup by appropriate agents at percentage of fault i.e. Ministry of Transportation/Telus/Contractor/Subcontractor

Table 33

- Densities not achieved
- Penalties End Product Specifications
- What tolerances?
- Critical path issues
- Cost increase
- Cost share to do job—Contractor/Ministry
- Safety team
- Cost of winter maintenance
- Informal meeting to discuss with Ministry Representative/Contractor/Subcontractor
- Partnering session needed
- Effects of change?
- Impact to scope?
- Damage control
- Make Ministry Representative/Contractor approve action plan

Table 35

- Ministry Representative wants to define what are failures and who pays for repairs if work proceeds
- Was job tendered allowing time needed to meet milestones?
- Ministry Representative what are consequences (maintenance)?
- Ministry Representative can't lay it on Contractor, was Contractor on time?
- Options:
 - Ministry of Transportation can waive density
 - Ministry Representative don't pave
 - Shared risk identified
- Can concerns be addressed by mix design, lift, thickness etc.?
- Identify pros and cons of options and present to Project Manager
- Ministry Representative feel ultimately owner must decide and identify as a serious issue if done early

Table 38

- Contractor to update schedule, update Traffic Management Plan and update Quality Management Plan

Question 9

The Contractor with his crew and equipment has shown up on-site to install a culvert—a two-day job. A lane closure and two traffic control people are required. Due to a communication mix-up between the Contractor and the traffic control people, the delineators are not on the site but instead are located in a storage shed three hour away from the job site. The Contractor wants to “make do” with the traffic control equipment that they have available on-site. The Contractor states that they will take responsibility for any problems.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 28

- Safety Issue, non negotiable

Table 29

- Communication between parties
- Safety issue
- Can work carry on with existing devices and still meet Traffic Control Plan?
- Can other work outside the required traffic control be done?
- Issue of liability. Stop work order if Contractor insists on working under the existing plan

Table 30

- No work will be done, site not safe
- Critical element is delineations; if he does not have them, no work is done
- Maintenance of Traffic Management Plan was to be followed
- Work with Contractor to change work to be modified while delineations are being brought on-site

Table 38

- Traffic Management Plan
- Comply prior to work

Table 31

- Contractor must adhere to Traffic Control Plan
- Safety issue
- Discuss alternatives... any acceptable?
- Assess safety—flexibility
- Contractor be prepared to take responsibility is not enough
- All processes documented and amended to the Traffic Control Plan
- Significant changes must be signed by engineer
- Safety responsibilities defined at Preconstruction meeting

Table 32

- Safety first
- Traffic Control manual rules
- Cost to Contractor
- No work until all parts in place
- Due diligence

Table 33

- Traffic Management Plan requirement
- Traffic Control Supervisor/Contractor/Ministry Representative meeting
- What prior work?
- Traffic volumes/peak time?
- Follow guidelines of Traffic Control Manual
- Make adjustments for area
- Delay work for three hours
- As long as staying above minimum requirement of Traffic Control Manual go ahead with agreed method

Table 34

- Risk
- Decision could be made at Ministry Representative level
- Check with approved traffic plan

Table 35

- Contractor not prepared
- Should send someone to get
- Safety issue
- Liability
- Will not allow to proceed
- Refer to Traffic Control Manual

Question 10

The contract has a milestone to have km 2 to 3 open by March 31, 2004 and, unbeknownst to the Contractor, this provision was included because the big-box developer will pay the ministry \$500,000 to complete the work by then. It's March 24th, there is a week's work left for top lift paving and pouring sidewalks but the forecast calls for continuous heavy rain all week

- As the Ministry Representative, what would you do?

Table 28

- Offer a bonus
- Discuss with Project Manager
- Should be a negotiation between developer and the Ministry

Table 29

- This issue should have been disclosed in the project documents so all parties are aware
- Ministry Representative should advise the Project Manager
- Ministry Representative could give the Contractor incentive to complete, issue lies with the Project Manager

Table 31

- How can this be done before contract is signed?
- Contractor should know about \$500k
- Bring third party developer into discussion
- Inform Project Manager
- Who's responsibility?
- Cost / benefit analysis
- Weekly meetings should have identified problems
- Ministry must take some responsibility
- Full discussion up to Project Manager, Contractor, Ministry Representative, big box developer
- Shared risk

Table 32

- Contact big box to reconsider/flexible
- To Contractor because he didn't know—no risk
- What is Contractor's schedule, should have accounted for rain
- Ministry will be out \$500,000 not Contractor
- Ministry should have shown the \$500,000 in contract
- Ministry may want to pave anyways to collect \$500,000 and accept product
- Contractor may be liable for late charges, missing milestone date

Table 33

- Seek immediate advice as \$200,000 involved requiring Assistant Deputy Minister's input
- Gather information as instructed
- Review past performance as per approved schedule
- Inform Project Manager of problem
- Request schedule showing ways to do and what can be done
- Open road on bottom lift of alternative to milestone
- Partnering meeting with Contractor
- Request a relaxation from big box developer
- Can do sidewalks under cover
- Do a cost vs. time calculation with Ministry weighing out cost of helping make milestone

Table 35

- Partnership should be clearly identified, developer not to pay
- Revise agreement and meet with developer, they may be behind
- Schedule flexibility?
- Negotiate with Contractor who gets \$500,000
- Owner must get involved in final decision
- Proceed with work and pay for remedial works out of \$500,000
- Can we invoke penalty?
- Could get political

Section B

Quality Control, Quality Assurance & End Product Specifications Breakout Session

Question 1:

The Contractor is in non-compliance with the Quality Control Plan. They have changed staff without advising you.

- **As the Ministry Representative, what would you do?**

Table 1

- Who is being replaced and what are the new person's qualifications?
- Reprimand in order, not necessarily a Non Conformance Report (NCR)
- Quality Control in breach
- Meeting with Contractor RE: Open Communication
- Insist on Contractor conferring with Ministry Representative prior to any further changes

Table 2

- Review credentials of new person
- Request update to personnel sheets and Quality Control Plan
- Request that in the future advise Ministry Representative before any changes are made

Table 3

- Ask the Contractor to supply name and qualifications of replacement
- Must have equal or better qualifications
- Ministry Representative to issue an NCR and advise Contractor not to repeat

Table 4

- Provide updated Quality Control Plan sooner
- Fairly minor problem
- Can be a NCR if it becomes reoccurring

Table 5

- Notify Contractor verbally and in writing
- Who is changed?
- Ask Contractor why change
- Ask Contractor questions on qualification
- Bring up at a weekly site meeting
- Amendment to Quality Control Plan
- Quality up in the air, if important—change
- Very cautious of stop work order—don't go there
- Communications not necessary—go on up the line

Table 6

- Why changed staff?
- Qualifications of new staff
- Changes in plan accepted by Ministry Representative and pass on to Construction Manager for comment

Table 7

- In the spirit of partnership discuss with Contractor the role of the individual and supply an equally qualified person
- Depending on role of Quality Control person, an NCR may be in order.
- The Contractor would have to revise the Quality Control Plan and give to Ministry Representative

Table 8

- Possible short or long term resume and qualifications of new staff
- Prior notice should have been given
- 1st consult and possibly issue of NCR
- Assess effect of changed personnel
- Leads to communication and partnering

Question 2:

The contract specifications require a Quality Control testing frequency for densities in earth embankment that seems excessive to practical requirements. The Contractor approaches you and asks that the frequency of testing be reduced by at least two thirds.

- **As the Ministry Representative, what would you do?**

Table 1

- Depends on stage of work. Results to date
- Two thirds may be a little too excessive
- Material may be weather and material dependant
- Bring in an engineer for consultation
- Record the changes
- Possibly increase the Quality Assurance
- Variability of testing results
- Consider Contractor's track record of due diligence

Table 7

- Evaluate performance to date and if satisfactory consider reduced testing but if testing indicated poor results after, then full Quality Control would be required

Table 2

- Review the request
- Honor consistency of testing specifications
- Proof of performance and consistency

- After a thorough review, make a decision based on testing results as to whether frequency can be reduced
- Ministry Representative should request geotech (expert) advice

Table 3

- Ministry Representative to discuss with Construction Manager and Geotech Engineer
- Contractor must satisfy Ministry Representative that he can consistently achieve minimum requirements
- Credit for reduced testing or acknowledgement of reduced cost

Table 4

- Contact designer and see how critical the application is and if it will be acceptable
- Consider liability
- Make a decision on available data
- Ensure consistency is present

Table 5

- What is testing process?
- What is the embankment material?
- Methods have to be reviewed by Ministry Representative to gain confidence and method of construction
- Monitored as conditions may change. Material change or construction method
- Go back to full frequency of testing if necessary

Table 6

- May permit some graduated reduction
- Revise Quality Control Plan
- Ministry Representative approve no further authority

Table 8

- Review Ministry standards
- Monitor results if quality is being achieved then confidence is established
- Potential cost savings to Ministry
- Possible Value Engineering Proposal submission savings to Ministry and Contractor and save time
- Tolerance of test, possible waiver
- Trust is an ingredient of partnering

Question 3:

Once the Quality Control Plan is acceptable for the lock block supply, and production and delivery begins, you ask the Contractor for his back-up documentation for the Quality Control done to ensure the blocks meet the specifications. The Contractor supplies you with two tests showing that the blocks meet the required 20 MPa strength. 500 blocks have been delivered to the site. You have no way of knowing if the test results are for those blocks delivered to your project.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 1

- Contravenes Quality Control Plan
- Contractor to get more documentation from supplier
- Contractor to inform the supplier as to requirements for documentation
- Issue an NCR
- Consider field testing to confirm quality
- Threat of rejection
- Does it meet Quality Control Plan?

Table 2

- The Quality Control should confirm that only two tests represent all 500 blocks because supplier may have done testing
- The Quality Control Manager should issue an NCR because not enough tests
- The Ministry Representative issues NCR
- Reject the blocks if not installed
- Take core, samples, and impact hammer tests (at suppliers cost and his choice)
- Decided Quality Control writes Non Conformance Report in consultation with Ministry Representative
 - Determine risk assessment and counter measures may be an option to use them at a reduced unit price.

Table 4

- Has Quality Control plan been followed?
- How can we determine if tests are for these blocks?
 - Who cast the blocks
 - Lot numbers
 - Onsite random tests if possible
- How critical are the blocks design use
- NCR to be issued
- Option to reject all

Table 3

- Contractor showed Non Conformance Report himself for not following Quality Control Plan
- Contractor has to come up with a plan to show blocks meet specifications
- More testing

Table 5

- Review Quality Control Plan for test frequency
- In house Quality Control for the supplier
- Contractor to provide certification for lock block
- Site inspection to submit hammering or core sampling

- Supplier check obligation for Quality Control
- Safety—Are They?
- Notify Contractor to supply documentation on all future orders

Table 7

- Contractor identify the breakdown in the Quality Management process
- Provide proper documentation
- Ministry Representative ask Contractor to come and test lock blocks
- What did Quality Control Plan show for testing required?
- Issue NCR

Table 8

- Request additional test information
- Traceability factor
- Ministry should perform Quality Assurance and if not acceptable issue an NCR
- Process and product

Question 4

The Contractor has hired a rock expert to design a blast plan for the project. You are given a copy of the plan and in your Quality Assurance review you notice it does not meet the specifications of the contract in spacing of the shear line holes. The contract requires 750 mm spacing and the design shows a spacing of 1250 mm. You discuss this with the Contractor and he argues that his design will give the desired results and this design is only for the test section anyway. Once they look at the results, they will tighten up the spacing if required. The test section has a volume of about 5000 m³.

- As the ministry Representative what do you do?

Table 11

- Review the blast plan but would allow test section at 1250 mm but not at 5000 m³, maybe 1500 m³
- If good relationship between Contractor and Ministry Representative should be dealt with it at the project level
- If increased to 1250 mm, would Ministry Representative see any potential cost savings to ministry for this?

Table 17

- Good opportunity for allowance of flexibility on Contractor's part
- Let Contractor do test section 12% of total rock area
- Phone call to original designer
- Make informed decision
- Partner with Contractor and designer
- Explore potential profit sharing if revised blasting design is successful
- Identify/confirm risk of failure lies with Contractor
- Confirm costs, time schedule would be responsibility of the Contractor

Table 37

- What purpose is the rock for?
- What is driving 750 mm spacing?
- Ask the Contractor why the 1250 mm?
- Would not let contract blast at 1250 mm
- Start at 750 mm and maybe move up to 1250 mm
- Consult with Geotech Engineer who came up with 750 mm
- Set up a meeting with all parties

Table A

- Note 5000 m³ is too large for a test section
- Remind the Contractor the intent of the specification is to ensure the quality for the work and the best way to do that is not to take a downside risk
- Error in the opposite direction
- Start with 750mm spacing and perhaps then open the spacing as much as can be until the optimum level is reached
- Communicate with Ministry Representative and rock experts

Table 14

- Start at 750 mm if it works it may open up spacing

Table 15

- Ask why he wants 1250 mm
- Bid as per specs
- Value Engineer?
- Size test section
- Ownership/responsibility

Table E

- Go with 1250 mm
- Contractor has to demonstrate
- Review Standard Specifications
- Partnering
- 5000 m³ is excessive vs. 190,000 (2.6%) [dependant on cut volume]
- negotiate

Question 5

Contractor presents Quality Control results indicating aggregate gradation is just in specification.

- **As the Ministry Representative what do you do?**

Two days later, Quality Control results indicate the gradation is just out.

- **As the Ministry Representative what do you do?**

Two days later, Quality Control results indicate the gradation is further out.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 11

- Ministry Representative to have open communication with Contractor
- Notify Contractor in timely fashion regarding all test results
- Be proactive
- Ministry Representative to talk to Contractor about alternatives in crushing/plant to make adjustment
- Ministry Representative to determine penalty/bonuses End Product Specification

Table 14

- Inform Contractor product is borderline
- Suggest making adjustments to crusher
- If test is “just” out, confirm with another test

Table 15

- Ministry Representative to talk to Contractor
- Propose to do to fix gradation—NCR
- Stockpile separate until in spec

Table 17

- Not to do anything except verbal discussion and warn of possible problems
- Look at trends
- Check process
- Stockpile separately if necessary

Table 37

- Talk to Contractor
- Look at testing procedures
- What can be done to improve?

Table A

- Proactive communication
- Ministry Representative advise Contractor he is on the line—Quality Assurance results may place them in penalty
- Encourage Contractor to make adjustment to move gradation away from limits
- If this is a crushing operation advise Contractor they may want to start a new stockpile so as to minimize the contamination
- Ministry Representative should advise Contractor of potential consequences if Quality Assurance results indicate penalty or rejection.
- Quality Assurance Test

Table E

- set variations
- first test done

- volumes
- out of specification/separate stockpile
- Solve problem: bleed sand, add rock, change pit location, holes in screens.
- Communication

Question 6

Ministry Representative has completed smoothness testing on a section of newly resurfaced pavement. Expecting good results, both you and the Contractor are surprised at the poor test results.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 19

- Project Manager should stop the work
- Get equipment out
- Take water samples
- Sediment Drainage Management Plan to control sedimentation
- Reinforce requirements with foreman and operators
- Review Quality Control Plan
- Notify Department of Fisheries and Oceans and other agencies

Table C

- Check test results
- Check machine calibration
- Isolate problem area
- Check line put down by Contractor
- Has the Contractor swept the highway
- If everything above checks out—penalty stands

Table D

- Inform Ministry Representative/Superintendent—meeting if required
- Check the machine profiler
- Retest if necessary with another operator

Question 7

Quality Assurance testing for 4,000 tonnes of asphalt mix indicates the material is in maximum penalty under the End Product Specification guidelines for asphalt content. The Contractor chooses to appeal the results. The appeal testing indicates the material is actually in reject.

- As the Ministry Representative, what would you do?

Table C

- Appeal testing is binding
- The Ministry may not make the Contractor replace the mix but may not pay for it
- May make Contractor mill and fill

Table D

- The results stand as is
- Contractor to revise plan to correct and bring into compliance

Question 8

The Contractor wants to start but they have not submitted their Traffic Management Plan.

- **As the Ministry Representative, what do you do?**
- What are your options for compliance?
- What if they start with just some “minor” traffic control with a promise to submit the full plan next week?

Table 28

- NO
- Remind Contractor of his obligation
- Full compliance required
- Look at reasons for the requirement and assess accordingly
- Does the Ministry have a vested interest in allowing
- Possible give a limited approval based on a site specific Traffic Management Plan
- Give a time that the full Traffic Management Plan must be submitted

Table 29

- No work until Traffic Management Plan is in place and approved
- Perhaps Ministry of Transportation could assist in its preparation
- It is a condition of the contract
- What exactly is the activity
- May not involve any aspect of roadwork and traffic control
- Allow small activities if the intended traffic control is in accordance with “Traffic Control For Work on Roadways” manual

Table 30

- Do not proceed until submitted
- What kind of procedure if they are allowed to go ahead without a signed plan
- No start until work submitted
- Have all ducks in a row at onset of project

Table 31

- No, there may be circumstances that allow for it to go ahead
- Anything completely removed from Traffic Management Plan
- May be site specific conditions where work can proceed—crushing?
- No to minor unless plan is in place before minor
- Write letter to Contractor allowing specific work before Traffic Management Plan is in
- Authority is in contract requirements

Table 32

- Working offsite is okay
- Construction signage still required
- Part of the mobilization item
- Plans to be submitted
- When do the Contractors want to start?
- Traffic control could be used for limited use
- Should not start work if plans not submitted
- Stop work if needed

Table 33

- No plan/no work
- Fast track approval if possible
- Bonding wouldn't accept not having
- Traffic Management Plan part of contract
- Even playing field

Table 34

- Do not allow Contractor to proceed (breach of process)
- Possibly allow off grade activities if other contractual items are in order
- Threaten stop work order

Table 35

- Assess scope of proposed works
- Assess risk associated with proposed work
- Consider asking Contractor for partial plan
- Public and worker safety is main concern

Table 38

- Traffic Management Plan required

Question 9

The Traffic Management Plan has been accepted and implemented. You observe that the implemented plan is not working when you observe many motorists speeding through the jobsite; many near miss traffic incidents and several complaints from the public regarding sign confusion.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 28

- Get Quality Control Manager and Traffic Control Supervisor immediately involved in an immediate action plan. If necessary direct Contractor to clear the highway pending a functional plan
- Issue NCR and insist on corrective actions

Table 29

- Review signing and setup, notify the Contractor
- Revise the Traffic Control Plan possibly, if necessary for volumes not anticipated.
- Traffic Control Plan needs revisions
- Increase cones/devices to attempt to control traffic
- Have RCMP make a visit to enforce posted speeds
- Contractor immediately check traffic control setup and signing

Table 30

- Stop work, sit down assess problems
- Review plan
- Activities stop
- Focus on problem.
- Look at what the problems are and use other means to slow down traffic

Table 31

- Review of Traffic Management Plan should be ongoing
- Changing conditions may result in shared cost
- Contractor responsibility to make it work
- Assess degree of safety
- Adjust placement and timing to make it work

Table 32

- Drive job to self assess
- Contractor should assess situation
- More Traffic Control Plan/signs configuration
- Reassess
- Safety issues addressed first

Table 33

- Meeting with Ministry Representative, Traffic Control Supervisor, Contractor to figure out why it isn't working
- Safety concern
- Less confusing and safe, ASAP
- Slow traffic via police or cones
- Respond to complaints by identifying issues and correcting them
- Due diligence
- Re look at signing

Table 34

- Address sign confusion with Contractor
- Contact police to help with speeders
- Ministry Representative/Contractor resolve

Table 35

- Have partnering meeting, identify issues
- Request revised plan in writing
- Update existing plan
- Stop work if not dealt with

Table 38

- Traffic Control Supervisor, Ministry Representative, and supervisor review Traffic Management Plan

Question 10

The results of 7-day compressive strength tests from bridge concrete footing indicate that the concrete may not achieve the specified 28-day strength. The Contractor is continuing to use this concrete mix design for the remainder of the substructure concrete. Another major concrete pour is scheduled for tomorrow

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 29

- Ministry of Transportation advise the Contractor in writing about strength concerns (ensure proper testing procedures)
- Contractor ensures the supplier is supplying the proper product, and reviews the mix design
- May be in line with the products reported and used
- Ministry Representative to notify Project Manager, then Design Engineer

Table 28

- Warn Contractor of potential problem and the ramifications of continuing with the pour (i.e.: Ministry will consider the work as unacceptable and withhold payment)

Table 30

- Write a letter to bring to their attention that you have concerns that they are not going to meet the specifications
- Explain to Contractor the consequences of not meeting the specifications
- Check with your concrete experts for confirmation

Table 31

- Contractor, Quality Control person, Ministry Representative, supplier
- Determine if poor test is anomaly in process
- Ministry Representative write letter outlining issue
- Quality Assurance submit potential NCR
- Make sure all Quality Control is in place
- Ministry Representative be prepared to issue stop work if Contractor cannot convince you that probability of pass is very high

Table 32

- Supplier not supplying right product
- Supplier Quality Control Plan not sufficient
- Put Contractor on notice, potential reject/penalty
- Contractor to notify supply on Quality Control results

Table 33

- Isolated incident?
- Consistent?
- Batch plant reliable?
- Check prior Quality Control, slump, air
- 7 day tests reliable

Table 34

- validate test result
- revisit mix design
- ask for revision to design for approval
- stop work order should be issued if not resolved

Table 35

- Need some assurance from supplier that 28 day will be okay. Advise them of risk and meet with all, ask for revision of mix design

Question 11

The bridge specifications require that all welding be done by welders that are qualified by the Canadian Welders Board. The ministry project supervisor discovers that the welding of the steel pipe piles to the pre-cast converter cap beams at the abutments has been done by a welder that was not qualified by the Canadian Welders Board. This welder is now doing similar welding at that pier.

- What should the Ministry Representative do?

Table 11

- Ministry Representative to write to Contractor the welds are not in compliance with specifications
- Ministry Representative to notify Project Manager and Construction Manager
- Ministry Representative to notify Contractor to stop work
- Contractor's responsibility to make the welds acceptable by further testing
- Welder not allowed to continue
- Any plan to proceed must be approved by the Ministry Representative

Table 14

- Get Canadian Welders Board welder on-site

Table 15

- Welder removed from site—NCR
- Welds check (Contractor's cost)
- Continue with certified welder

Table 17

- Contractor not compliant
- Welder cannot proceed
- Inspect welds

Table 19

- Issue an NCR
- Contractor's Quality Control Plan to be reviewed
- Contractor to determine how he wants to rectify

Table 35

- Need certified person or specialist to determine acceptability of welds or redo work
- Need to meet contract requirements

Table 37

- Inspect what was done before
- Test the welds that have been done
- Bring in certified welder

Table 38

- Ministry Representative to advise Contractor

Table A

- Welding is not compliant with the contract and cannot be accepted
- Advise Contractor in writing that the welds do not meet contractual requirements and are unacceptable
- No further work is to be done by the welder
- The onus will be on the Contractor to determine what to do to make the welds compliant (i.e. x-raying, magnafluxing, coupon tests etc)
- However, good welds do not qualify the welder
- Contractor's plan to address the issue must be acceptable to the Ministry Regional Bridge Engineer

Table C

- Quality Management issue
- Stop welding
- Letter to Contractor, welder not certified therefore all the work he has done is not certified
- Contractor may check welds with x-ray
- Make sure Bridge Engineer accepts the remedy/solutions

Table D

- Welder not allowed to work until certified
- Contractor to ensure work to date is in compliance with specifications

Table E

- Welder to be removed
- Test to verify welds (i.e.: x-ray, ultrasound)
- What happened to Quality Control Plan?
- Welding procedure?

Section C – Environment Breakout Session

Question 1

In July 2004, within the Fisheries Window, construction is occurring on a culvert approved by Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection. Before the culvert is installed, survey and layout are done and it is evident that the culvert inlet and outlet inverts are .6m above the streambed.

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 1

- Bring in design engineer to confirm or change design
- Explore the history of the creek
- Lower the culvert—environmental review necessary?
- Expedite decision because of limited window
- Possibly avoid standby by conferring with Contractor to carry out other works

Table 2

- Review the design criteria, check survey, etc.
- Ministry Representative discuss situation with all parties to redesign
- Get approval from Department of Fisheries and Oceans
- Charge as Contractors drawings to reflect change

Table 3

- Ministry Representative and Contractor should discuss problem to come up with solution
- Ministry Representative to confirm suitability with designer

Table 4

- Where are we in the window?
- Double check the survey
- Check with Department of Fisheries and Oceans
- Is there an extension window available?

Table 5

- On-site meeting with Ministry Representative Contractor, Environmental Monitor, designer of culvert
- Ask for a design change if required
- Review for mitigation
- Documentation

Table 6

- Determine design criteria
- Knowledgeable survey layout personnel can identify as soon as laid out
- Inform authorizing agency of requirement to lower
- Could be designed as a sediment control

Table 7

- Accept intent that culvert was to be below streambed
- Ministry Representative and Environmental Monitor to make a minor design adjustment in the field

Table 8

- Question design of culverts
- Confirm with design and environmental representatives
- Expedite decision and document window restrictions
- Consider material design if covered structural concerns (stronger pipe etc)

Question 2

The contract specifications do not allow burning of wood waste and indicates the wood waste must be chipped and no greater than 30% of the volume of an unsuitable materials disposal site. Although there is no indication on the plans, during construction Department of Fisheries and Oceans requests that stumps and other woody debris be placed in some of the local salmon streams to provide habitat complexity. In addition Ministry of Water, Land and Air Protection requests woody debris placements in terrestrial areas as small wildlife habitat on the right-of-way.

- **What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?**

Table 1

- Design issue with Contractor as per request
- Bring in all parties as to request and discuss viability of doing the work
- Placement of wood must be done under proper environmental design
- Should be monitored by the environmental team

Table 2

- Environmental Monitor and Ministry Representative to get clear plan or instructions from Department of Fisheries and Oceans and MWLAP as to where to be placed and permit issued in writing!
- Ministry Representative, Project Manager, Environmental Monitor and Construction Manager should be consulted to make approval
- Considerations whether a savings or higher cost beyond scope then Project Manager must approve extra funds.

Table 3

- Ministry Representative and Environmental Monitor come up with a plan of what is required by Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection
- Ministry Representative discusses with Contractor and asks for a price to perform work
- Credit on chipping?
- Ministry Representative to discuss with Construction Manager and Project Manager such funding if required
- Invited Department of Fisheries and Oceans and Ministry of Water, Land and Air Protection
- representatives to attend and/or direct work the request
- At least have Environmental Monitor

Table 4

- Get written instruction on required work
- Have a site meeting with Department of Fisheries and Oceans
- To be paid by Force account because it is not in the plans
- Follow proper procedure request Department of Fisheries and Oceans onsite if possible

Table 5

- Ask for onsite meeting with Department of Fisheries and Oceans, Environmental Monitor, Ministry Representative, design specialist and Contractor
- Quick action as Contractor might stop grinding
- Estimate cost
- Authorize payment—saw-off for grinding

Table 6

- Would agency contribute to costs as per their request?
- Could be Provisional Sum if anticipated in design
- Get approval from Construction Manager and Project Manager of additional funds
- Work would be “Force” as it is ‘custom’ type of work
- Design approved by Department of Fisheries and Oceans etc.
- Who would direct work Department of Fisheries and Ocean/Environmental Group/Ministry Representative

Table 7

- Contractor initiates a charge to Environmental Plan on approval of Department of Fisheries and Oceans/ Ministry of Water, Land and Air Protection
- Extra work may be in order to Contractor if work is in excess of chipping

Table 8

- Possibly consult manager about future maintenance concerns
- Possibly relocate desired work cost implications assuming a provincial sum for this type of work (Force account)
- Consultation with Environmental Representative and Department of Fisheries and Oceans essential as well as MWLAP
- Determine works with consultation and expedite
- Define details of work

Question 3

In May 2003, a stream keeper group has contacted the media and project staff complaining about siltation and poor environmental construction practices on a highway construction project. The Contractor is working to the environmental requirements in the contract documents, Standard Specifications, regulatory approvals and Best Management Practices. You observed that after some recent rainstorms turbid runoff is coming from an upstream active logging operation. The same stream keeper group contacts you and says they are working on a fish enhancement project with Department of Fisheries and Oceans and would appreciate any extra construction materials for their project (e.g. Filter cloth, seed mix)

- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 1

- Diplomatically explain that it actually is not the Contractor causing the problem
- Environmental Monitor brought in to explore the situation
- Invite stream keeper for a visit and explain the Contractor's compliance
- Environmental Plan has been signed off and is being complied with
- To appease the situation maybe work into an agreement with Contractor to hydro seed under provincial supervision

Table 2

- Have a meeting with stream enhancement group to show them your environmental plan and due diligence being implemented on the project
- As a good will gesture, give excess materials for stream enhancement groups

Table 3

- Ministry Representative to write letter to stream keepers and advise about siltation starting off site
- Extra materials—Ministry Representative/Contractor discuss and suggest giving surplus materials to stream keepers
- Contractors choice

Table 5

- Meet with Contractor onsite
- Ministry Representative to determine that the site was not the cause and meet

with stream keeper group to show the work the Contractor has done to prevent siltation

- Get the work out (communications agents)
- Project Manager for assistance on extra materials as Contractor can't afford to give anything away
- Possibly assess material cost/specific material they are interested in

Table 4

- Double check your plan
- Ministry Representative to meet with group and explain
- Assist group where materials are available (good P.R.)

Table 6

- Donation of some materials to stream keeper group could go a long way towards good relations
- Contractor to set up siltation control on inflow water
- Environmental Monitor and/or Ministry Representative to report to environmental agencies
- Respond to stream keepers on action taken

Table 7

- Communication between all parties have meeting to resolve
- Hire neutral party
- Give stream keepers extra materials if available (P. R.)
- Investigate if can't resolve issue

Table 8

- Address in a timely manner
- Request turbidity test upstream and downstream of the construction
- Verify construction related to turbidity
- Refer parts to the Ministry of Transportation Media Liaison Officer

Question 4

It is mid-summer and the Contractor has approached the Ministry Representative regarding a local farmer's small borrow site, which he said could be used for the active highway construction if the drainage ditch in the farmers field is cleaned by the construction Contractor. The ditch has about 15-30cm of water depth and is overgrown with grasses and weeds. Using the farmer's granular materials will be a good cost and time savings of which the Contractor is willing to share the savings, compared to the granular source identified in the contract.

- As a ministry Representative what would you do?

Table 37

- Assessment has to be done on ditch
- Look at impact

- Check with the Agricultural Land Reserve
- Consult with environmental agency

Table 11

- Contract proper agencies Ministry of Water, Land and Air Protection, Feds
- Contact Environmental Monitor to prepare plans
- Provisions must be in place prior to work
- Cost saving identified by Contractor and outline proposal
- Contact and meet with stakeholders
- Approval levels Feds, Ministry of Water, Land and Air Protection and Project Manager
- Determine enhancement requested by agencies
- Two permits need for ditching and ALC

Table 14

- Is the stream a fish habitat?
- Check for fish
- Cost review. Is it worth the effort?

Table 15

- Agricultural Land Reserve?
- Fish?
- Timing of habitat assessment
- Treat as part of the contract for assessment
- Need Ministry of Transportation buy in
- Whose Environmental Monitor should look into?
- Responsibility of the contract to prove out
- Long process for approvals
- Ministry of Transportation Environmental Contractor to be notified and selected for comments while Contractor's Environmental Monitor investigates

Table 17

- Suspicious of water
- Responsibility by law
- Environmental Monitor/contact Department of Fisheries and Oceans
- Cost/benefit of using source
- Make possible deal to make with Department of Fisheries and Oceans for building habitat
- Documentation
- Inform Project Manager of change of costs
- Maybe past history with farmer/liability issues
- Ministry Representative responsible for decision and verifying approvals
- Confirm suitable material
- Hard for Ministry Representative to avoid liability

Table A

- Is there a chance the drainage ditch is a watercourse with fish?
- Due diligence?
- Fisheries assessment is a must!
- If no environmental issues accept the farmer's offer
- Contractor to provide evidence to Agricultural Land Commission, environmental agencies and Department of Fisheries and Oceans
- Have appropriate agencies involved and in place or work cannot proceed
- Fisheries assessment
- Water assessment
- Agency referral
- Cost savings

Table E

- Agricultural Land Reserve approval
- Habitat check—where does creek go? (frogs etc.)
- Avoid ditch
- Section 9 approvals
- Contractor to seek approvals, partner with Contractor

Question 5

You have a one month Fisheries “window” and it starts within two weeks of mobilization in the rural section. One month is not enough time to get the work done given the “available equipment”.

- **As the ministry Representative, how do you proceed to solve this and through whom?**

Table 11

- Construction schedule would show Fisheries window and construction could be met
- Up to Contractor to provide enough equipment to meet the window
- Could ask agencies for extension of Fisheries window

Table 15

- Meet with Contractor—renew equipment
- Better to follow
- Contractual environmental obligation
- Check to see if window can be changed
- Apply for extension if required
- Contractor's problem if it's his fault

Table 17

- Check to see if variance can be achieved through agencies by Environmental Monitor

- How do you propose to do work to Contractor/other equipment
- Contractor's responsible if window not held up by ministry award, etc.

Table 37

- Supplemental equipment if it is feasible?
- Why is there not right equipment on-site?

Table A

- Contractually the Contractor must provide sufficient equipment to get the work done in time
- Double shifting?
- Contractor supported by Ministry could approach Department of Fisheries and Oceans/ Ministry of Water, Land and Air Protection and negotiate a variance
- At the end of the day it is Contractor's responsibility

Table E

- Tender appropriate time extension Contractor seeks
- Unforeseen circumstances—partner and speak with agencies
- Accelerate schedule

Question 6

You discover the Contractor has made a private deal with a local land owner/farmer next to the grading area for dumping of wasted and stripping instead of trucking it

5 km to the approved waste site.

- As the Ministry Representative, what do you do?
 - Turn a blind eye to this;
 - Ask for \$ back on the basis of savings to the Contractor
 - Shut it down because it is non-conforming
- What else should you do to ensure there is no risk to the ministry?
- What else should you do to ensure that the deal is okay contractually?

Table 19

- Agricultural Land Reserve
- Shut it down
- Maybe they have an approval
- Check for other problems Sediment Drainage Management Plan for the site
- Check with contract
- Check with local Government for their concerns

Table C

- As Ministry Representative allow Contractor to do, he is responsible
- Contractor is in business to make money
- With environment agency (permit)

- Should the Ministry Representative let the Contractor do this?—Yes
- Other Contractors may complain

Table D

- Meetings initiated with Ministry Representative/Contractor
- Permits from Agricultural Land Commission / Municipal / Regional District

Question 7

The Environmental Construction Monitor reports that a piece of equipment is illegally working in the creek. He says he told them to “stop work” but was told to “buy a candy”. He comes to you for your support.

- **As the Ministry Representative, what do you do?**
 - **Support the monitor and stop the activity;**
 - **Get the monitor to call the environmental agencies;**
 - **Bring the Contractor and the agencies together to discuss the issue;**
 - **Delay payment over the issue**

Table 19

- Environmental Monitor should stop the work
- Get equipment out
- Take water samples
- Sediment Drainage Management Plan to control sedimentation
- Contractor reinforce with foreman, operators with requirements
- Review Quality Control Plan
- Notify Department of Fisheries and Oceans other agencies

Table C

- Support with stop work order
- Discuss with environmental agencies and Contractor as soon as possible
- Contractor should be responsible

Table D

- Stop work in creek
- All of the above
- Environmental Monitor/Contractor/Ministry Representative

Question 8

A Fisheries officer visits the site and sees equipment working in-stream illegally. He orders a cease work directive, takes samples and “reads you and the Contractor Superintendent your rights”.

- **What actions should you take to ensure a quick and coordinated and appropriate response to the issue?**

Table 19

- Refuse to speak without legal representation
- Immediately cease the in-stream work

- Call in Ministry Environmental Monitor, Contractor's Environmental Monitor
- Start documenting and take pictures etc. to prepare for legal actions

Table 28

- Notify the Project Manager, Environmental Monitor of problems
- Maybe necessary to continue if life and/or property is at risk, to be discussed with Environmental Monitor and/or Department of Fisheries and Oceans
- Determine reasons for being "in-stream" illegally
- Document, take pictures, samples to standards, divisional procedures required

Table 30

- Stop working
- Contact Environmental Monitor
- Check to see if there was any authorization to do work in-stream
- Check to see if Contractor is adhering to Environmental Plan

Table 31

- Stop work immediately
- Document/photograph
- Comply
- Prevention
- Remedy
- Review sediment and drainage plan is in violation of plan
- Take comparative samples
- Organize meeting of all parties
- Take up to chief environmental office

Table 34

- Cease operation in stream and notify: Environmental Monitor, Ministry Representative, Contractor, and Manager
- Photos, appropriate tests, record events for future litigation

Table 32

- Direct Contractor to remove equipment from stream
- Silt fences
- Meet Environmental Monitor/Contractor/Ministry Representative/Department of Fisheries and Oceans
- Ensure sediment/drainage plan is adhered to
- Preconstruction meeting with construction workers before reentering area
- Ensure Environmental Monitor does more frequent monitoring

Table 33

- Stop work order—Why?
- Document with pictures and samples.
- What is the solution? Is Environmental Plan in place to allow in-stream?
- Meeting with Environmental Monitor, Contractor, Ministry Representative, Department of Fisheries and Oceans, regulatory agency

- Sediment Drainage Management Plan, permit, STOP
- Inform Project Manager, Construction Manager

Table 35

- Comply with order
- Document
- See about possible mitigating works
- Notify owner
- No work to continue except as directed by Fisheries official

Table 38

- Stop work
- Remove equipment
- Secure site
- Take photos, video, and notes
- Contact Environmental Monitor, Environmental Monitor Coordinator, Project Manager, Construction Manager and call company owners

Question 9

Your paving Subcontractor is about to mobilize on grade that has been built two months ago. Weather is dry and clear. Near the swamp you notice a few frogs along the grade one day and the next day thousands are all over the grade and up and down the ditch lines along a 500m stretch. They seem to be moving across the grade toward the swamp that is 450m away

- As the Ministry Representative, what will you ask the Contractor to do and how will you deal with this situation?
- What actions should each party take to ensure a quick, coordinated and appropriate response to the issue?

Table 28

- Call in Environmental Representative
- Work out a method of protecting the frogs

Table 29

- Communicate problem with Contractor, cease operations
- Call in Environmental Monitor for recommendations
- Advise Contractor of “changed conditions” and will be deal with through contract language
- Extension of time not reimbursable delay

Table 30

- Shut down project
- Check and see if this is unexpected reschedule work
- Look at schedule see if possible to start work at different location
- Create frog passage

Table 31

- Stop work
- Mobilize in another area
- Involve Environmental Monitor, get professional opinion
- Unforeseen condition
- Reimbursable delay

Table 32

- Consult Contractor/Ministry of Transportation to stop work—shared problem
- Seek tech support
- Have Contractor work elsewhere
- Extension of time required for any design changes (i.e. culverts)

Table 33

- Identified in contract
- Addressed in Environmental Plan
- Environmental Monitor informed?
- Stop until okay
- Proceed outside area to work
- Cease work in area until environmental review and determine where else to work
- Extension of time?
- Reimbursable delay?
- Measures to keep them on this side of road
- Annual migration?
- Long term solution from Project Manager/Construction Manager

Table 34

- Seek advice on mitigative measures
- Evaluation done by appropriate environmental agencies
- Document situation
- Avoid area until resolved if possible
- Handled at Ministry Representative level
- Change of scope and design revision approved by Project Manager

Table 35

- Stop work in area
- Hop over section to new site and come back later
- Look for methods of control (i.e. frog fencing)
- Determine possible delay if left as is
- Advise Project Manager of delay and schedule impacts
- Involve Environmental monitor, Ministry of Water, Land and Air Protection

Table 37

- Contractor: Stop work temporarily
- Contact environmental control group/Environmental Monitor to see if the frogs are “valued”
- Try to control frog access

Question 10

You discover you do not have a signed Fisheries authorization from Department of Fisheries and Oceans just as the Contractor is to start his in-stream work.

- **As the Ministry Representative, how would you deal with this to prevent a claim by the Contractor?**

Table 28

- Contact agencies, stay out of creek
- Contact Contractor if required
- Negotiate

Table 29

- Contract Department of Fisheries and Oceans to determine status of permit where is responsibility with Contractor or Ministry of Transportation
- If Contractor ensure required documents get to Department of Fisheries and Oceans and if Ministry of Transportation Representative should discuss with Contractor that reimbursable delay may apply
- The Ministry Representative should try to mitigate costs if possible
- Again work together through the partnering process

Table 30

- Stop work!
- Contractors review of Quality Management Plan
- See if responsibility of permit was Contractor’s responsibility
- If not responsible for not having permit in place Contractor could be entitled to compensation

Table 31

- Who was responsible to get permit? GET IT
- Negotiate with Contractor to see if other work can be done to prevent time loss
- If Ministry responsible to get permit—focus available resources at getting permit as soon as possible
- All involved felt it extremely important that the Ministry keep a strong hand in environmental issues
- Owner must be responsible for liaison with any third parties

Table 32

- Call Department of Fisheries and Oceans to try to expedite approval
- No work until permit is approved/signed

Table 33

- Ministry responsible for permit
- Letter to Contractor informing no permit
- Meet with Fisheries or contact at least to find out where process is at
- Get signed as soon as possible
- Inform Project Manager, Construction Manager
- Quality Control didn't catch? Quality Assurance?

Table 34

- Notify authorities immediately and do not commence work
- Notify Project Manager as it may impact costs
- Is there another area that they may work in the interim
- No way to avoid a claim, direct Contractor to proceed in other works

Table 35

- Stop work by mutual agreement or Stop Work Order
- Ministry Representative work with Contractor to secure approval ASAD
- Assess impact on schedule if any advise Project Manager

Table 38

- Call Project Manager and Environmental Coordinator
- Meet with Contractor to discuss possible work activity outside perimeter
- Expedite permit delivery to site
- Ministry Representative to discuss, contact Environment Representative to permit restrictions

Appendix C

Authority Levels for Consultants – Definitions & Examples

Project Element	Definition
Ministry Representative (MR)	Consultant or Ministry employee that works at the construction site, issues instructions to the Contractor, and is the Contractor's point of contact with the Ministry
Construction (Contract) Manager	Ministry employee to whom the Ministry Representative reports
Project Manager	Ministry employee who has authority over the Project Scope, Budget and Schedule
Partial Waiver of Quality Specification	Acceptance of work that fails to meet a quality requirement by a small tolerance and/or infrequently. Tolerance limits to be as established by the Construction (Contract) Manager
Design: Minor Adjustments	Example: Design grade adjustments to tie in to existing facilities
Design: Minor Changes	Example: Addition of storm water inlet to intercept unforeseen surface drainage
Design: Major Changes	Affects a standard design element, structural integrity or design liability. Examples: Alignment Change, Laning Revisions, Changes to Geotechnical Design (bad ground, cut/fill slopes etc.)
Scope	Extent of work identified to execute the intent of the Contract
Scope Changes	Changes that alter the functionality or extent of the work. Examples: Adding 1500 m of curb & gutter. Adding left turn slots to an intersection. Adding frontage roads.
Non-Scope Changes	Changes that do not substantially alter the functionality or extent of the work. Examples: Adding 50m of curb and gutter. Adding drainage culverts. Making field fit adjustments.
Contract Price	Price of Construction Contract, excluding Contingency
Total Project Budget	Total of the cost of the Construction Contract, Contingency, Engineering, Materials and Property Acquisition.

Authority Levels for Consultants – Authority Levels Matrix

Project Element	Authority Level				
	Consultant	Ministry of Transportation		Ministry or Third Party	
	Ministry Representative (MR)	Construction (Contract) Manager	Project Manager	Specialist	Design Engineer
Partial Waiver of Quality Specification	Decision & Implementation within agreed tolerances	Consultation if beyond agreed tolerances		Consultation (if needed)	
Quality Acceptance and Outright Rejection	Decision & Implementation beyond agreed tolerances	Consultation for Rejection (if needed)		Consultation (if needed)	
Design: Minor Adjustments	Decision & Implementation				
Design: Minor Changes	Decision & Implementation	Consultation (if needed)		Consultation (if needed)	Consultation (if needed)
Design: Major Changes	Recommendation & Implementation	Decision & Approval		Consultation (if needed)	Design
Scope Changes	Recommendation & Implementation	Recommendation to Project Manager	Decision & Approval		
Non-Scope Changes	Decision & Implementation				
Interpretation of Plans, Specifications & Special Provisions	Decision & Implementation within limits of understanding	Decision beyond MR's limits of understanding	Consultation (if needed)	Consultation (if needed)	Consultation (if needed)
Measurement of Work Quantities	Decision & Implementation				
Schedule Changes within Contract Completion Date	Decision & Implementation				
Extensions of Contract Completion Date	Recommendation & Implementation	Recommendation	Decision		
Payment for Contract Work within Total Contract Price	Decision & Sign-off				
Work Order or Supplemental Agreement within Total Contract Price	Decision & Sign-off				
Contingency spending < \$50,000	Recommendation	Decision ... or	Decision		
Contingency spending > \$50,000	Recommendation	Recommendation	Recommendation to higher level		
Payment for Other Work or Materials within Total Construction Project Budget	Decision & Sign-off				
Forecast Overrun in Total Project Budget	Immediately notify Construction (Contract) Manager and Project Manager		Recommendation to higher level		

