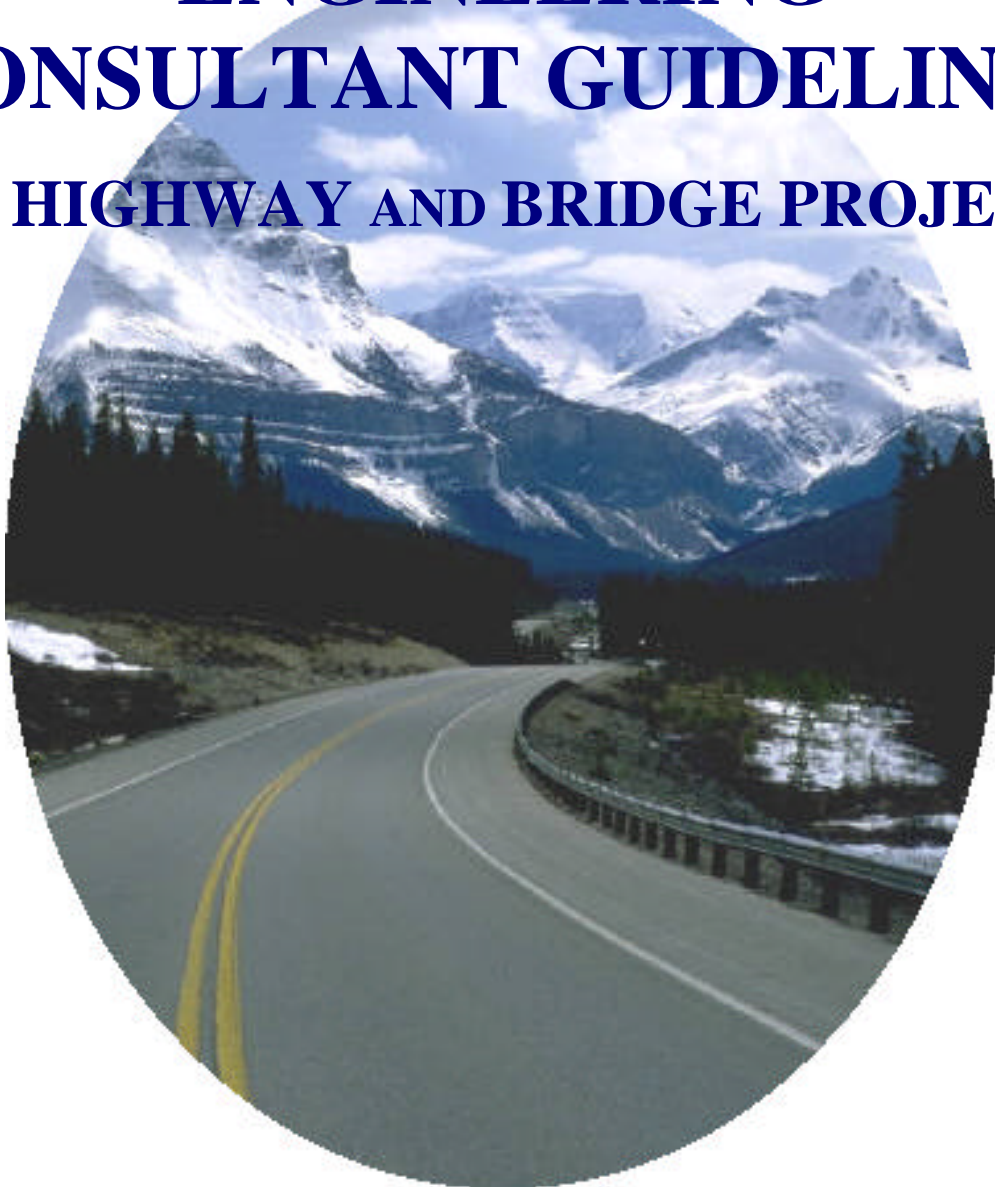




**ENGINEERING
CONSULTANT GUIDELINES
FOR HIGHWAY AND BRIDGE PROJECTS**



**VOLUME 1
DESIGN AND TENDER
2002**

ENGINEERING CONSULTANT GUIDELINES FOR HIGHWAY AND BRIDGE PROJECTS – VOLUME 1 – DESIGN AND TENDER

The purpose of this manual is as follows:

- To outline the Department's expectations for the provision of engineering services for the design and tendering of all provincial highway and bridge projects where a consultant is hired directly by the Department.
- To ensure uniformity and consistency in the provisions of these services to the Department.
- To outline specific responsibilities and authorities of the consultant when providing these services.

The consultant's obligations are detailed in the consulting service agreement and construction contract documents. This manual outlines the deliverables established by the Department which will typically fulfil the consultant's obligations and ensure that Department requirements are met in the desired manner.

Users should note that this manual by itself does not provide a complete record of all the processes, responsibilities and authorities of the consultant and the Department in managing the delivery of a Department construction contract. Other manuals which must be considered include but are not limited to the following:

1. Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration
 - this document was previously known as the Contract Administration Manual and provides guidelines covering the post-tender period.
2. Project Administration Manual
 - this document outlines the Department's internal methods of administering engineering agreements and construction contracts as well as selecting, monitoring and evaluating consultants.
3. Traffic Accommodation in Work Zones Manual
 - this document is to be used as a guideline for provision of traffic accommodation through work zones on highways and bridges in Alberta.

The authorities, responsibilities and processes contained in all these manuals are based on the Department's policy statements, authorities matrix, contract specifications, and agreements for engineering consultant services. Users are advised that updates or revisions to existing contract specifications, the terms of the agreement, policy statements or the authorities matrix may affect these processes, responsibilities and authorities. In the event of any such changes

which significantly affect the contents of these manuals, users will be advised accordingly. Please refer to Appendix “N” for a listing of additional Department publications.

This manual is not intended to replace or modify the contents of the Department’s construction contracts or engineering consultant agreements. If a conflict or ambiguity exists between this manual and the contract agreement, the user shall contact the Director, Highway Engineering, of the Department’s Technical Services Branch for clarification.

Any omissions, obvious errors, or recommendations for future updates should be forwarded to the Director, Highway Engineering of the Department’s Technical Standards Branch.

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SECTION 1 - GENERAL

1.1 INTRODUCTION

These guidelines, appendices and references shall be used for the provision of engineering services on all Provincial highway and bridge projects where a Consultant is hired directly by the Department. These guidelines may also be used when stipulated for projects not undertaken directly by the Department but where the funding agency (whole or partial funding) is Alberta Transportation.

Where a discrepancy exists between this document and the documents prepared specifically for a project, for example the Terms of Reference for a project, the latter shall take precedence. Because of the evolving nature of standards, guidelines, legislation, regulations, specifications and engineering practices, it is impractical to expect all the contents of this document and the documents referenced to be up-to-date. The Consultant is responsible for using current standards, design codes and guidelines and for ensuring that all current legislation and regulations are being followed. A list of current Federal and Alberta Provincial legislation and regulations that are relevant to highway planning, design, construction and operations is contained in Appendix "M". This list is not all-inclusive.

In the event of discrepancies, the hierarchy of documents shall be as follows, in descending order:

- Legislation and Regulations
- Agreement¹
- Terms of Reference¹
- Engineering Technical Standards¹, Warrants¹ and Processes
- Engineering Consultant Guidelines for Highway and Bridge Projects

In keeping with a spirit of innovation, the Department is interested in hearing innovative proposals from Consultants at the 'Request for Proposal' stage, if it is apparent that projects can be undertaken more efficiently or effectively using an alternative approach rather than that outlined in the Terms of Reference. This spirit of innovation will be encouraged by Department staff when developing Terms of Reference for a project, and when evaluating proposals that have been submitted.

The Prime Consultant retained by the Department is responsible for the engineering integrity and professional liability of all work performed under their Agreement, including work by any Sub-Consultant. The checking of the Consultant's or Sub-Consultant's work by the Department or the signing of drawings by Department staff does not relieve the Consultant from any responsibility for the work. Therefore these

¹ See Section 1.1.1 - Definition

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guidelines will generally use the terminology of “acceptance” rather than “approval” when referring to engineering issues submitted to the Department by the Consultant.

1.1.1 DEFINITIONS

The following words, when used in this document, shall have the meaning as defined below:

Acceptance	Work is accepted by the Department without detailed checking of the engineering principles and calculations.
Agreement	The consulting services agreement between the Department and the Consultant, normally called the “Consulting Engineering Agreement”.
Alberta Land Surveyor	A person registered to perform land surveys in the Province of Alberta.
Approval	The subject work shall be “approved” by the Department for matters relating to things such as Department policy, funding, contract extensions or over-runs, right-of-way purchase, or Contract Design Change Proposals. The Department will also review or approve Design Exceptions as required (see Section 1.6.1).
As-Constructed Drawings/Details	The updated original road and bridges contract drawings/plans, records, surfacing structural information and surfacing diagram which show any changes that have occurred during construction. All drawings submitted after August 2002 shall be in Microstation .dgn format.
Bridge Assessment	A formal review of bridge condition, functionality controlling issues and technical parameters with respect to the crossing and roadway approaches. A key objective is to identify optimum strategies for preservation, rehabilitation or potential reconstruction of the crossing over the life cycle of the structure. See Appendix J1-4 for more details.

Bridge Planning	An engineering process for bridges undertaken at the pre-structural design phase including but not limited to bridge assessment, planning, geometric design, hydrotechnical design, site location and survey, environmental determinations, preliminary geotechnical investigation and development of optimized concepts for advancement to structural design.
Bridge Structures	Consist of: <ul style="list-style-type: none">▪ Bridge Size Culverts.<ul style="list-style-type: none">▪ Standard culverts are structures with diameters (or summation of diameters) of greater than or equal to 1500mm and less than 4500mm.▪ Major culverts are structures with diameters (or summation of diameters) of 4500mm or greater and structures of lesser diameter having complex site constraints or specialized engineering requirements.▪ Standard Bridges - bridge structures built using standard plans. Typically standard bridge construction comprises standard precast girder deck and steel or concrete abutments (and piers when applicable) supported on steel piles.▪ Major Bridges - all other bridge structures including large or complex culverts. Major bridges are built from site-specific drawings. Typically major bridges are river crossings, highway interchanges or railway crossings.
Consultant	The person or company that has entered a consulting engineering agreement with the Department.
Contract	The contract between the Department and the Contractor covering the performance of the work.
Contract Design Change Proposal	An alternate design or a design modification to the Department's tendered design or a component thereof. If required, the Contractor shall submit this proposal (through the Department's Project Sponsor) after the tender is awarded.

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Contractor	The person or company that has entered into a construction contract with the Department.
Department	Alberta Transportation.
Design Exception	<p>A design exception is generally an instance where a value lower than the minimum standard is used. A design exception may also be an instance where a designer has chosen to use a parameter or product which is different from the prevailing practice. The product or parameter may be more or less costly to provide. The term is generally used in the context of geometric design standards. Documentation of the rationale used for the design exception must be filed as part of the design tender package for future reference.</p> <p>All design exceptions proposed by a consultant must be submitted in writing to the Project Sponsor. The Project Sponsor will ensure that Technical Standards Branch is informed and given an opportunity to have input prior to the approval of Design Exceptions.</p> <p>Because of the diversity of engineering and planning subjects covered by this guide, there is no one person or party given “sole” responsibility for approval of Design Exceptions. The handling of proposed Design Exceptions shall be managed by the Project Sponsor in an appropriate way based on the nature of the proposal and project. See Section 1.6.1 for additional information on Design Exceptions.</p>
Design Package	Includes grading, surfacing and bridge design packages which are used as the basis for preparation of the contract tender. It generally includes the detailed design calculations, notes to the Project Manager, Utility Agreements, environmental permits, etc. The completed and independently checked package is normally submitted to the Project Sponsor. A sign-off letter is prepared by the Consultant for the Project Sponsor’s signature for submission to Professional Services Branch prior to tendering.
ECO plan	The Environmental Construction Operations plan consists of plans and written procedures that address environmental protection issues relevant to the specific activity being performed during construction of a project.

Engineering
Assessment

A formal assessment of various technical and safety parameters and/or performance data generally using a predefined methodology or warrant system. An engineering assessment is generally undertaken early in the construction programming cycle to allow the scope-of-work to be accurately estimated. Examples of engineering assessments are Geometric Assessment, Safety Assessment, Surfacing Strategy, etc. See Section 5 for more details.

Estimates

“A” Estimate

A “Program/Planning Estimate” which is a “Ball Park” estimate to be prepared before any design calculations are made for roads and bridges.

For roadway grading, base, and paving projects the “A” estimate may be based on a typical cost per kilometre all inclusive cost (including engineering, materials costs, right-of-way, utilities, mobilization, contract costs, etc.) from past experience of average cost in the vicinity. The “A” Estimate may be refined after an Engineering Assessment has been completed.

For bridge structures, this estimate is usually produced at the Functional Planning stage and is usually based on the typical square metre cost for the overall deck area.

See Appendix “I” for an example.

“B” Estimate

A “Preliminary “B” Grading Design Estimate” which is prepared when preliminary earthwork quantities have been established after 1 or 2 computer runs have been made. A Preliminary “B” Surfacing Estimate is prepared when the surfacing strategy has been established. These estimates may be updated one or more times before the “C” estimate is prepared.

Each subsequent “B” cost estimate submission for either roads and bridges needs to be identified as “B1”, “B2”, “B3” etc. estimate when a greater accuracy is identified at a later stage of design. The number will designate generation or occurrence.

For bridge structures, the “B” estimate is usually produced when the structure type, and overall dimensions are known (out to out, width, etc.).

See Appendix “I” for an example.

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“C” Estimate	A “Final Design Estimate” which is to be prepared when the “Grading Estimate Summary” and the “Surfacing Estimate Summary” have been completed for roadway grading, base and paving projects. Typically this estimate is produced after the final design is completed. For Bridge structures, the “C” estimate is produced when the construction drawings and estimated quantities are available. Refer to Section 11 for more details. See Appendix “I” for an example.
“D” Summary	A bridge estimate produced when the actual tender prices are known. See Appendix “I” for an example.
Final Details	The term “Final Details” is used to describe the package of information that must be compiled and submitted at the completion of construction work. A detailed description of the requirements of “Final Details” for roads and bridges is provided in the Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration. “As-Constructed” drawings for each roadway and bridge project are to be included as part of the Final Details. A “Final Details Report” is required for each bridge file where construction or rehabilitation work is undertaken as stipulated in Volume 2.
FOIP	Government of Alberta legislation entitled “Freedom of Information and Protection of Privacy Act.”
Preliminary Engineering	An engineering exercise undertaken early in the detailed design process, the purpose of which is to gather preliminary site surveys, geotechnical and other information used and reaffirm the key design parameters that should be used on the project. In cases where a Planning Study and/or Engineering Assessment has been undertaken for the project the Preliminary Engineering process will involve “revisiting” the previously made recommendations. On projects where there is no Planning or Engineering Assessment available, the Preliminary Engineering exercise will involve establishing the key design parameters based on normal Department practices. See Section 6 for more details.

Professional Engineer	A person registered to practice engineering in the Province of Alberta under the APEGGA Act.
Project Administrator	A Department employee who has been designated by the Project Sponsor to administer the Project on a day to day basis.
Project Co-Sponsor	An individual primarily responsible for a particular component of work, such as highway or bridge work.
Project Design Brief	A document that is completed by the Consultant for major bridge projects. The document lists salient points and design assumptions prior to any detailed design work. The purpose of the document is to ensure that the Consultant and the Department agree on the main design assumptions before the design progresses to detailed work. An example of a brief is included in Appendix "J1". A blank brief will be made available to the Consultant at the project initiation meeting.
Project Sponsor	The Department employee appointed by the Department to be responsible for the delivery of the project. The Project Sponsor is the Department's Senior Manager responsible for the Project/Assignment.
Request for Proposal	<p>A formal document that includes a cover letter defining the preparation of the proposal, the basic insurance requirements expected of the Consultant and has the Terms of Reference attached to it.</p> <p>A Request for Proposal system seeks the best value through open competition or the competition of short-listed proponents, and, most importantly, it is a system which provides for both objective and justifiable reasons for its choices.</p>
Road Drainage Culverts	Culverts with an equivalent diameter of less than 1.5 m and which are included with the road design package.
Sub-Consultant	A person or company that enters into an agreement with the Consultant to carry out part or all of the work covered in the Agreement.
Technical Standards,	Documents listed under Technical References in

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Guidelines and Warrants Tender Package	Appendix “M” at the end of these Guidelines and other AT documents listed in Appendix “N”. The end product of the design phase of the project. This package normally includes tender documents, plans, design summaries, cost estimates and covering memos.
Terms of Reference	A document outlining the description of the assignment, the scope of the work, schedules and expected deliverables.

1.1.2 OUTLINE OF THE PROCESSES USED BY THE DEPARTMENT FOR PROCUREMENT OF CONSULTING SERVICES

The major steps employed by the Department in the hiring of engineering consultants for Highway and Bridge projects are as follows:

1.1.2.1 Pre-qualification Process

The Department requires consultants for highway and bridge projects to be pre-qualified in one or more of the following areas:

- Functional Planning
- Highways
 - Chip Seal
 - ACP (including GBC)
 - Grading
- Bridges
 - Planning (including Preliminary Engineering)
 - Design (including Rehabilitation)
 - Project Management (including Construction Inspection)
- Complex Projects
- Quality Assurance Testing and/or Superpave Mix Design Services on Department Highway Projects

Consultants may submit a request for pre-qualification in any or all of these categories. Pre-qualification is determined by evaluating submissions made by Consultants.

The Department conducts a yearly review/assessment of all pre-qualified consultants to assess changes in staff and capabilities which may affect the consultants’ pre-qualification status.

The consultant pre-qualification process is explained in detail in the Project Administration Manual (P.A.M.).

1.1.2.2 Request for Proposal (R.F.P.) Process

The following approaches are used by the Department:

- Sole Source R.F.P.
- Competitive R.F.P.
 - a) Open Call (on MERX)
 - b) Short List
 - Developed through Project Ranking List process (See Section 1.1.2.3)
 - Developed by Department staff taking into consideration of project requirements, consultant capabilities, and consultant availability

1.1.2.3 Project Ranking List

At various times during the year, the Department prepares lists of approved projects requiring consultant services. These lists are sent to all pre-qualified consultants to rank the individual projects based on their interest in being invited to submit proposals for the work. The Department uses these rankings to develop short lists for these projects (typically, 3 consultants would be short listed for a specific project) and initiates the competitive R.F.P. process.

1.2 WORKERS COMPENSATION BOARD AND OCCUPATIONAL HEALTH AND SAFETY

1.2.1 GENERAL

The Consultant's responsibilities under the Occupation Health and Safety Act are defined in the Agreement as follows:

The Consultant shall familiarise themselves, their staff and their sub-consultants with the terms of the Occupational Health and Safety Act and Regulations to ensure complete understanding of the responsibilities given and compliance required. The Consultant acknowledges and accepts all of the responsibilities and duties of the "Prime Contractor" as defined in the Occupational Health and Safety Act. The Prime Contractor shall to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety System or process to ensure compliance to the Act and Regulations by sub-consultants. The Consultant shall also, to his

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satisfaction, ensure that any sub-consultants are able to comply with all health and safety requirements before commencing work.

As the Department representative on site, the Consultant will communicate with Contractors and Utilities Companies and may have to arbitrate disputes between them when they are working in the vicinity of each other.

1.2.2 WORKSITE HAZARD

The Consultant has the responsibility to identify worksite hazards and shall develop operational occupational safety policies, procedures and plans which are specific to the work being performed to ensure the safety of workers, whether employed by the Consultant or Sub-Consultant(s). The impact of the public traveling through the site must be considered when developing these plans (if applicable). When requested by the Department, the Consultant shall provide copies of these safety policies, procedures and plans to the Department prior to the commencement of the work, along with verification that they have been submitted to Workplace Health and Safety.

If Workplace Health and Safety conducts a worksite inspection which results in “orders” being issued to the Consultant, the Consultant shall immediately supply copies of these orders to the Project Sponsor or the Department Safety Officer.

In cases of recognized imminent danger or when the Consultant fails to comply with safety orders issued or fails to rectify previously identified worksite hazards, the Project Sponsor, a Department Safety Officer or any other authorized Department representative will order the cessation of the work until it is safe for the work to resume. Their interpretation of a worksite hazard will be considered as final in all cases.

1.2.3 ACCIDENT INVESTIGATION AT THE WORKSITE

In the event of an injury or accident involving workers of the Consultant, or his/her Sub-Consultant, at the worksite as defined by the Occupational Health and Safety Act, the Consultant shall conduct an accident investigation where required by Section 13 of the Occupational Health and Safety Act. In addition, the Consultant shall supply a copy of this investigation report and obtain copies of the Contractors accident reports to the Project Sponsor within 72 hours of knowledge of the occurrence.

Where there is a worksite accident involving the Contractor’s personnel, the Contractor shall conduct the investigation and the Consultant shall submit a copy of the investigation report to the Project Sponsor within 72 hours of knowledge of the occurrence.

1.2.4 SAFETY CERTIFICATE OF RECOGNITION

The Department will only prequalify and award assignments to Consultants who have achieved accreditation/recognition in a Safety Certification Program which is relevant to their industry and which is recognized by Alberta Human Resources and Employment, Workplace Health and Safety. Accreditation/recognition will be in the form of a Certificate of Recognition in Health and Safety (COR).

Consultants shall submit proof of accreditation with their annual pre-qualification. The Department may verify the Consultant's compliance with this requirement through the Alberta Construction Safety Association (ACSA) at any time, and any firm found not to have current accreditation will have their pre-qualification rescinded.

It is the prospective Consultant's responsibility to ensure that their registration in the program is properly documented with the Alberta Construction Safety Association, and the Department will assume no liability for errors or omissions by the Alberta Construction Safety Association in this regard.

For Consultants have not obtained a Certificate of Recognition in Health and Safety, a valid Temporary Letter of Certification (TLC) issued by Alberta Construction Safety Association will be considered acceptable. A small employers certificate of recognition (for employers with less than ten employees) is not considered acceptable.

Firms providing only specialist or sub-consultant services (e.g. environmental, scour, appeal testing etc.) if they do not perform work on the public highway may not be required by the Department to be certified by Alberta Construction Safety Association.

1.3 PUBLIC SAFETY REQUIREMENTS (TRAFFIC ACCOMMODATION THROUGH THE WORK ZONE)

1.3.1 GENERAL

Accommodation of traffic may be required at any time through the planning, preliminary engineering, design, construction, and post construction phases. Refer to "Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration" on procedures for traffic accommodation operations.

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Traffic control devices shall be constructed, installed and maintained in accordance with the Department's latest version of "Traffic Accommodation in Work Zones" manual.

The Consultant shall be responsible for identifying situations that will require special traffic accommodation procedures to be implemented. These situations could involve major utility or pipeline relocations, bridge construction, the need to accommodate high traffic volumes, major grade line changes, lane closures, etc.

If traffic control is found to be inadequate, the Consultant shall take appropriate and timely action to rectify the situation.

- **Planning, Preliminary Engineering and Design Phase**

During planning, design, preliminary and legal survey operations, geotechnical work such as test holes/test piles the Consultant shall be responsible for provision of suitable traffic accommodation measures.

Preparation of traffic accommodation plans showing signing, delineation, traffic lanes, etc., for all detours, diversions or partial road closures, shall be undertaken by the Consultant.

The Consultant shall install and maintain any required traffic control devices.

- **Construction Phase**

Please refer to the latest version of "Traffic Accommodation in Work Zones" manual.

1.3.1.1 Flagperson

When the Consultant is undertaking surveying/engineering/inspection/field reconnaissance/ field investigation operations that may cause interruption, delay or hazards to the travelling public or anyone on the worksite, qualified flagpersons shall be provided as required for the direction and control of traffic. The Consultant shall ensure that flagpersons are instructed in the use of proper traffic control procedures appropriate for the prevailing conditions. Flagpersons shall have proof of certification from a recognized training program on traffic control procedures through construction zones. The Department currently only recognizes traffic control programs administered by the Alberta Construction Safety Association.

Flagpersons shall be dressed in accordance with the guidelines in the "Traffic Accommodation in Work Zones" manual.

1.3.2 ACCIDENT INVESTIGATION WITHIN THE PROJECT LIMIT

Should any third party accident involving highway users (vehicular or pedestrian) occur within the project limits, the Consultant shall investigate the accident and provide the Project Sponsor with a report on the prescribed forms (see Volume 2) within 72 hours of knowledge of the occurrence. If fatal or major accidents involving serious personal injury or major property damage occurs, the Consultant shall immediately notify the Project Sponsor or the Department Safety Officer of the incident. The accident report will include a record of conditions at the time of the accident, photos, description of all pertinent signing and other traffic control devices in place at the time. Blank form of the "Report of Motor Vehicle Traffic Collisions Occurring in Construction Zones" is available in the "Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration".

1.4 OTHER GENERAL REQUIREMENTS

1.4.1 PROFESSIONAL REGISTRATION

All Consultants engaged to provide engineering services for the Department shall be registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) and shall abide by the Association's regulations, code of ethics and by-laws.

Land surveyors who are doing legal surveys for the Department must be registered Alberta Land Surveyors.

1.4.2 PROFESSIONAL SEAL

The Consultant shall sign, seal and date all plans, drawings, specifications, designs, data and any other engineering documents they produce, check and/or approve. The seal shall consist of the APEGGA member stamp or seal and the permit stamp.

1.4.3 CONSULTANT INVOICES

Consultants shall code vouchers for payment of Consulting Engineering Agreement invoices. This is the first step towards an electronic payment voucher.

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Appendix “L” contains a sample payment voucher and directions on use. The Consultant shall obtain a disk from the Project Sponsor containing these documents.

Consultants shall utilize this payment voucher when submitting invoices to the Department.

For information related to procedures for scope changes, please refer to the PAM manual.

1.4.4 CONSTRUCTION SPECIFICATIONS AND CONTRACT CONDITIONS

The current edition of the Department's “Standard Specifications for Highway Construction”, “Specification Amendments and Supplemental Specifications for Highway Construction”, “Standard Drawings for Highway Construction” and “Specifications for Bridge Construction” shall apply to all construction contracts. They may be modified and supplemented by special provisions, plans, specification amendments, or supplemental specifications. The Consultant shall be the engineering representative engaged to administer construction contracts on behalf of the Department. The Consultant cannot change any condition of the contract between the Department and the Contractor.

1.4.5 SPECIAL CONSIDERATIONS IN INDIAN RESERVES

The Department's normal practice is to use aboriginal labour, equipment and material resource supply as much as possible (through mutual agreement with the local Aboriginal organization) when undertaking construction work through Aboriginal lands. The Consultant should follow current Department policy in these matters. At the time of writing the Department's policy was "under development". Consultants should contact the Department's Capital Planning & Aboriginal Affairs Branch for the latest information in this regard.

Additional time may be required for Right-of-Way acquisition on Crown lands through Indian Reserves because of the greater complexity of the process. For Right-of-Way acquisition through Indian Reserves, each project shall be assessed on its own merit and dealt with accordingly.

1.4.6 RECORDS, FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

Any information collected or generated by a Consultant, when providing engineering services, is the sole property of the Department. This information is subject to the Records Management Regulations of the Government and the FOIP Act. Refer to Appendix “K” to ensure that records are retained accordingly. When asked to give out information the Consultant must contact the Project Sponsor prior to doing so, in order that the FOIP Act is not violated in regards to privacy and personal information. Refer to Appendix “L” for a sample request for corporate information form.

1.4.7 MANUALS

All guidelines, manuals or other documents referred to in these standards are the current edition or version unless specifically noted. Refer to Appendix “N” for a listing of documents available for sale at the time of writing.

1.4.8 DUPLICATING

The Executive Director, Technical Standards Branch, hereby gives permission for the Consultant to copy these guidelines solely for use within the firm.

1.4.9 UPDATES

The Department will update these guidelines on an as required basis. Updates are normally done through the rewrite of the complete document on a regular basis (usually every 3 years). The Consultant shall ensure that the most recent version of the guidelines is used on all projects.

Updated information related to Design and/or Construction is released by the Department through Design Bulletins and Construction Bulletins respectively. These bulletins are made available to consultants and others through the Department’s website. Bulletins are numbered sequentially and dated. The Bulletins will continue to be displayed until the information is superseded either by a more permanent document (e.g. a Design Guide, Specification, etc.) or when more current information comes into use.

Consultants are required to monitor the Design and Construction Bulletins on a regular basis to ensure that they are following the latest Department practices. At the time of writing the web addresses for the bulletins are as follows:

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Design Bulletins:

www.trans.gov.ab.ca/Content/doctype233/production/design_bulletins.htm

(as of December 2001)

Construction Bulletins:

www.trans.gov.ab.ca/Content/doctype245/production/construction_bulletins.htm

(as of December 2001)

1.4.10 WEBSITE

The Department's current web address is www.trans.gov.ab.ca (as of December 2001). A search engine is available on the website to assist in locating information.

1.5 RESPONSIBILITIES

1.5.1 GENERAL

The Consultant shall complete the assignment as described in the Agreement. The Consultant shall also monitor all aspects of health and safety on the project. The Department will tender and award all construction contracts, and will administer holdback, contract security and be involved in settlement of construction contract related claims (in consultation with the Consultant).

The Consultant shall supply all personnel, materials and equipment required to provide the services in accordance with these guidelines.

The Consultant shall be responsible for all work performed under the Agreement, including work done by any Sub-Consultants.

1.5.2 CHANGES TO SCOPE OF WORK FOR ENGINEERING ASSIGNMENT

Any changes in the scope of work or the Terms of Reference of the Agreement that impacts upon the time frame or costs of the project shall be brought to the attention of the Project Sponsor by the Consultant. These changes to the scope of work shall be in writing including the estimated costs and shall be submitted as soon as they become apparent, for review and approval. Scope changes having impact on engineering costs of the project will be recorded on the cost control sheet submitted with the invoices.

NOTE: *Except for emergency situations, the Consultant shall not proceed unless an authorization to do the work is given by the Project Sponsor.*

1.5.3 BACKGROUND INFORMATION

The Consultant shall identify and review all historic records, archives and information relating to the project. The Department's files and archives will be available for the Consultant's review and use. A "Request for Corporate Information" form indicating record types, storage areas, and the contact persons are included in Appendix "L".

Electronic reporting is to be used when available and Department programs will be made available to Consultants unless restricted by licensing or other requirements.

1.5.4 LIAISON

For each project, a Project Sponsor will be appointed by the Department to act as the liaison between the Department and the Consultant.

The Project Sponsor will have the overall responsibility of ensuring that the work is planned, coordinated and executed in accordance with the Agreement. The Project Sponsor will liaise between the Consultant and the various branches within the Department to resolve any administrative, technical or contractual matters. Open interactive communication between the Consultant and those Department branches involved in the project is promoted, on the understanding that the Project Sponsor is kept apprised of the content of this communication.

1.5.5 PROJECT INITIALIZATION

The Project Sponsor is responsible for ensuring that each activity and phase of the work is completed as scheduled. To do this, prior to any work commencing on a project, the Project Sponsor will normally call a Project Initialization Meeting with the Consultant, the Department Safety Officer, and any appropriate specialist staff from the Department, to clarify the assignment, expectations and staff roles, to review the scope of the work to be done, the safety strategy, the reporting requirements (during planning or design work as identified in the Terms of Reference), the standards to be used, the time frame for the overall project, as well as any significant milestone dates within that time frame for specific activities. Project Administration information such as Agreement number, job numbers, sample forms, revised procedures, etc. will also be provided to the Consultant at this meeting. The Project Sponsor will advise the Consultant of all issues that may affect the Consultants work plan (e.g. tendering schedule, right-of-way negotiations, borrow purchase). See Appendix "B" for Sample Agenda Items and the Project Administration Manual (P.A.M.) for other details.

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Details on the Consultant Performance Evaluation process are contained in the P.A.M..

1.5.6 APPROVAL OR ACCEPTANCE

The following, and other unforeseen matters, shall be referred to the Project Sponsor or appropriate Department branches for approval or acceptance unless authority is delegated elsewhere:

- Approval – Refer to Section 1.1.1 for definition.
 - Change of Project Personnel
 - Public participation programs
 - Planning report
 - Roadway preliminary engineering report
 - Significant changes to project funding requirements
 - Property Agreements
 - Design Exceptions/Changes (after tender)
 - Changes to scope of work and fee increases
 - Specified start and/or completion dates for the contract and any other conditions related to construction schedules
 - Bridge assessments and bridge planning concept meeting
 - Contract Design Change Proposals
 - Unit prices for bid items that were not included in the original tender
 - Contract claims resolution
 - Extra work (as per the Departments Authorities Matrix)
 - Contract Payments
 - Contract over-runs
 - Contract extensions
 - Railway Crossing Agreements
 - Utility Crossing Agreements
 - Public Advertising on behalf of the Department
 - Site occupancy changes

- Acceptance – Refer to Section 1.1.1 for definition.
 - Environmental permits, licenses and investigations
 - Engineering Assessment Report (see Section 5)
 - Bridge and bridge culvert design package
 - Utility plans and adjustment methods
 - Other Contract and Design Changes (prior to tender)
 - Electronic file formats
 - Geotechnical investigation and report
 - Grading design package

- Surfacing design package
- Final project design, cost estimates and tender package
- Progress and Final Payment for Construction Contracts
- Final Details
- Final Bridge Planning Summary Report

1.5.7 COST ESTIMATES

Accurate and timely submission of cost estimates including current unit costs is important for the Department's programming function.

The Consultant shall provide the following cost estimates:

- Planning Stage
 - "A" Preliminary cost estimates with all planning studies and bridge assessments
- Design Stage
 - "B" cost estimates on completion of preliminary designs
 - "C" cost estimates on completion of final design with tender packages
 - "D" cost summary after contract award (for bridge structures only)
 - Utility relocation and adjustment estimates
 - Surfacing estimate
 - Grading design estimate
 - Tender package cost summary
- Construction Stage
 - Progress and final estimates
 - Refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration for more details.

1.5.8 INDEPENDENT DESIGN CHECK

The Consultant shall undertake an independent check of all designs, Contract Tender Package, drawings, and final details by a qualified and experienced Professional Engineer, prior to submission of the work to the Department. Tender estimates and progress estimates shall be prepared and independently checked by either a qualified and experienced engineer or technologist. All documents and drawings shall show the names and/or signatures of persons responsible for design and checking. This independent design check shall be carried out by another Consultant when the design Consultant does not have adequate in-house capabilities to provide this check.

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For Independent Design Check of bridge planning and bridge structural design, also refer to Section 10.3.

1.5.9 REVIEW OF WORK BY THE DEPARTMENT

Any review of the Consultant's work, signing of drawings and the acceptance of documents by Department staff does not relieve the Consultant from any responsibility for errors or omissions by the Consultant.

1.5.10 CONSULTANT PERFORMANCE EVALUATION

At the project initialization meeting, the Project Sponsor will advise the Consultant of appropriate form(s) to be used, and as required, also identify the criteria/weighting/timing that will be used as the basis in the evaluation process. See the Project Administration Manual for further information on this process.

1.6 DESIGN PHILOSOPHY

1.6.1 GENERAL

While undertaking planning studies, preliminary engineering or detailed design, Consultants are expected to achieve "best value" for the project dollars while still achieving a safe, functional and efficient design for the road-user. The guidelines, warrants, and practices contained in the Department's Design Guides (Highway Geometric Design Guide, Pavement Design Manual, Bridge Design manuals etc) should be followed in general. However, where there are significant constraints especially areas with rough terrain conditions (steep hills, muskegs, sharp river valleys, winding river crossings, widening of narrow roads, existing developed infrastructures etc.), it may not be practical or desirable to maintain normal standards. In these circumstances, to ensure that designs are "optimized", some design parameters may be adjusted in a safe manner to reduce construction costs.

Occasionally a design exception may involve use of a design parameter, which exceeds normal standards or practices. The use of modified design parameters (lower or higher standards) shall be analyzed, documented (to show the rationale used for the exception generally including economic justification, impacts on road users and risk analysis), reviewed and approved or accepted by the Department. The approval/acceptance process shall include a written submission by the Consultant to the Project Sponsor, referral to Technical Standards Branch (T.S.B.) and others as

required and signing off for “acceptance” or “approval” by T.S.B. and the Project Sponsor. The Consultant should indicate in his initial submission whether he is requesting approval or acceptance. Department acceptance is appropriate where the Consultant is willing to assume the engineering risk associated with the exception. In cases where the Consultant wishes to share the risk with the Department, it should be clearly indicated that “approval” is sought. Documentation shall be filed for future reference.

1.6.2 CONTRACT DESIGN CHANGE PROPOSALS

The Standard Specifications allow the Contractor (after a tender has been awarded), the option of submitting a Contract Design Change Proposal for an alternative design or change to the Department’s design. In the event of a “contract design change” the Department’s expectations of the Consultant and Contractor are outlined in the Standard Specifications. Depending on the nature of the proposal, the technical details may be very complex or relatively simple. The Consultant will generally be involved in the review and there is an expectation that deadlines will be met.

The review/acceptance process may involve several branches of the Department including Technical Standards Branch and Business Management Branch. Consequently, the Consultant is required to have the resources available to facilitate this process in a timely way. In the event that a proposed Contract Design Change is approved, the Department’s Business Management Branch needs to be involved so that the necessary contractual changes can be made. Contract changes should be made before the work is undertaken.

If a Contract Design Change Proposal is submitted and the Department asks the Consultant to participate in the assessment of the proposal and subsequent engineering work, a change of scope to the original Agreement may be made if required. Refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration for more detail.

1.7 USE OF ALL TERRAIN VEHICLE (ATV’s) FOR ENGINEERING ACTIVITIES

The Department, in recognition of the substantial cost savings that can be made through the use of ATV’s for engineering activities (e.g. field surveys), has made arrangements for the delegation of authority so that ATV’s may be permitted to operate on the highway right-of-way under special permit. Consultants should make their request (see Appendix “L” for a Sample Order) to the Project Sponsor who in turn will arrange for Regional Director’s approval. The ATV Operator shall carry a

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copy of the Permit when conducting work. Regional Directors may grant permission subject to certain conditions. The following conditions will generally apply:

1. ATV's cannot work on the highway finished pavement surface (shoulder to shoulder).
2. ATV's can cross highway surfaces, but must follow existing Legislation. (Unnecessary highway crossings must be avoided).
3. The registered owner(s) of the ATV's must ensure that ATV operators are trained and fully qualified to operate ATV's. A valid operator's license of a class higher than a learner's permit shall be obtained by an ATV operator prior to doing work in the highway right-of-way.
4. The use of ATV's must be restricted to daylight hours only.
5. All employees on the ATV's must wear fluorescent red-orange safety vests. The safety vest shall have the word "SURVEY" or "CONSTRUCTION" or "MAINTENANCE" on the back of the vest, or alternatively on the back of the ATV machine. These employees must also wear protective headwear that has been approved by one of the following organizations:
 - Canadian Standards Association (CSA)
 - American National Standards Institute (ANSI)
 - Snell Memorial Foundation
 - British Standards Association
6. ATV's must be licensed, insured, and equipped as defined in the existing legislation.
7. If unique safety hazards are identified, the Department reserves the right to refuse the use of ATV's for survey activities.
8. The Work area where the ATV's are to be used should be limited to 3 kilometres in length. This is particularly important if the work zone is to be "signed". Unless surveyors (not ATV's-see item 1) are actually working on the road surface, the need for warning signs is minimal.
9. The Department will require that the ATV users develop a safe work procedure for this specific operation. If several Consultants will be involved in this type of operation, a joint safe work procedure shall be developed to accomplish the work.

Additional conditions are currently being considered to ensure that survey crews will be easily distinguishable from other ATV users in the highway right-of-way. The use of rotating amber light attached to a pole in the ATV machine is also being considered at this time and may also be required. These conditions will be clearly stipulated in the permit.

1.8 REPORTING REQUIREMENTS

All written communication between the Consultant and the Department shall be through the Project Sponsor. If stipulated in the Terms of Reference or at the initialization meeting, there may be a requirement to send copies of correspondence to other persons, for example the Co-Sponsor.

During planning, preliminary engineering and design activities the Consultant shall advise the Project Sponsor as required of progress on the project and discuss upcoming work, milestones and critical issues. Regular meetings shall be held with the Project Sponsor as required.

Progress Review meetings shall be called by the Consultant at the conclusion of milestone events and when technical or other progress matters need to be reviewed. The Consultant shall review the work of Sub-Consultants before being brought forward to the Progress Review meetings for discussion. These meetings will generally be held at Department offices or on site.

Minutes of all meetings will be taken by the Consultant and circulated within 5 working days. For reporting requirements concerning contract administration refer to Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration.

Current References for Section 1:

Freedom of Information and Protection of Privacy Regulation (Alberta Regulation 200/95), 2001, Province of Alberta.

General Safety Regulation (Alberta Regulation 448/83), 2000, Province of Alberta.

Highway Geometric Design Guide, 1999, Alberta Transportation. Occupational Health and Safety Act, 1994, Province of Alberta.

Standard Specifications for Highway Construction, 2001, Alberta Transportation.

Specification Amendments and Supplemental Specifications for Highway Construction, 1998, Alberta Transportation.

Standard Drawings for Highway Construction, 2000, Alberta Transportation.

Specifications for Bridge Construction, 2001, Alberta Transportation.

Traffic Accommodation in Work Zones Manual, 2001, Alberta Transportation.

Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, 2001, Alberta Transportation.

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SECTION 2 - PLANNING

2.1 GENERAL

The Consultant shall undertake planning studies which typically will consist of the following types of projects with details outlined in the specific project Terms of Reference.

- A corridor study for new highway.
- An alignment study within a new corridor or along existing highway.
- A functional planning study which may include geometric improvements, bridge location study, access management, new interchanges, modifications to existing interchanges, new intersections, modifications to existing intersections, public roadside developments (such as weigh sites, vehicle pull-offs, rest areas etc.) or private development impact accommodation. New developments occurring during the study period shall be addressed.

As part of the planning study, the Consultant may be requested to prepare the basic right-of-way plans and right-of-way request for the project (refer to Section 3.1 and Appendix “D” Planning Requirements).

The proposed location of the highway will be subject to the Department’s final approval. Where planning studies recommend design parameters that are not compatible with current accepted standards/practices, an engineering rationale should be provided.

2.2 DATA COLLECTION

Before embarking on data collection activities, the Consultant shall review the existing data available in the Department or through other sources/agencies. This data may include:

- Previous planning documentation (reports, plans, files, surveys etc.)
- Traffic data
- Collision information
- Highway geometrics (profile and alignment)
- Pavement condition
- Bridge inventory, condition inspection data, correspondence file
- Attributes that may influence the study such as utilities, drainage, structures or adjacent developments
- Aerial photography

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- Identification of possible contaminated sites
- Right-of-Way owned by AT
- Geotechnical reports

2.3 TYPICAL STUDY CONSIDERATIONS

Where required, the Consultant shall recommend a roadway standard based on factors such as traffic volumes, roadway service classification and the Department long range network plan. A typical study shall consider factors such as, but not limited to:

- Highway safety
- Consistent application of geometric standards
- Geometric Assessments of all existing paved roads
- Highway continuity
- Staging requirements (short and long term)
- Traffic assessment
- Bridge and/or river training assessments
- Bridge functionality
- Geotechnical investigations
- Major drainage requirements (especially in semi-urban and urban areas)
- Impact to adjacent property and developments
- Utility impact (location and cost)
- Land use impact
- Environmental issues (Federal and Provincial Requirements)
- Historical Resource Overview
- Estimated construction cost comparison and analysis
- Benefit Cost analysis
- Access and service road requirements
- Public involvement considerations
- Right-Of-Way requirements
- Traffic control devices and illumination
- Pavement conditions
- Noise
- Aesthetics
- Truck weight, length and geometric requirements

As required, several alternatives should be compared and summarized in the form of a formal planning report to produce a cost-effective design to get the best value for the Departments investment.

2.4 PLAN PREPARATION

The Consultant is responsible to obtain plan and report identification numbers from Highway and Roadside Planning at the initiation of the project. These numbers are to be indicated in all plans or documents and used in the naming of the electronic files. Naming convention shall be obtained from Highway and Roadside Planning.

All plans are to be submitted in Microstation format. The Department is currently using Microstation SE on a Windows NT format.

2.4.1 MOSAIC PLANS

All planning studies require the preparation of mosaic plans unless otherwise specified. Mosaic plans are to be prepared to the Department's standards (refer to Appendix "D").

2.4.2 CONTOUR PLANS

Some planning studies will require the preparation of contour plans. Standards shall be reviewed with the Department prior to undertaking this work.

2.5 STAKEHOLDER INPUT

The Consultant shall submit a written "Communication Plan" to the Project Sponsor and discuss the proposed alternatives with the local authorities, regulatory agencies and general public as required. These discussions may be in the form of general meetings including open houses. All meetings must be documented. Approval of this plan from the Department is required prior to presenting any information to the public. Refer to Appendix "D" for the Typical Public Input Process. This process may vary depending on project specifics. The Consultant will be required to prepare a summary of the public input process in the final report. Also, all original questionnaires, sign-in sheets, letters, etc. are to be bound separately and submitted to the Department. (This information is to be kept confidential as per FOIP requirements).

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2.6 FIELD WORK

The Consultant shall undertake field reviews of proposed alignments, and establish alignments on the ground (particularly at river crossings or in areas of extreme topographical constraints). Refer to Location Survey Requirement in Appendix “D”.

2.7 PRESENTATION OF RECOMMENDATION

The majority of planning studies will require presentation(s) to the Department’s Divisional Executive Committee (Transportation & Civil Engineering Division) or a similar group. A brief project summary (25 copies) complete with recommendations must be submitted at least 1 week prior to the presentation. At this presentation the Consultant shall outline the project objectives, discuss alternatives and make recommendation. The time required for this formal presentation would depend on the nature and complexity of the job, however, it could be estimated that 20 minutes be used for presentation and 20 minutes for questions and answers.

2.8 REPORTING REQUIREMENTS

The Consultant shall produce a written, unbound, camera ready (8” x 11” plus mylar) report (complete with plans) for all planning studies. The reproducible copy shall consist of unbound pages (up to 11” x 17” size). Any sheets that are larger than 11 x 17 shall be provided on mylar for reproduction purposes. In addition to the hard copy of the report and plans, the Consultant is also required to submit the electronic/digital files for the report and plans. The Consultant shall submit the draft planning study for review by the Department to reach a consensus before finalizing the report. The report must include all details pertinent to the project, including but not limited to background, alternatives, functional plans, estimated costs and justification for the recommendations made. Departmental approval is required for the reports. The planning study shall not be complete without this approval.

Additional information on record management is included in Appendix “K”.

Current References for Section 2:

Navigable Waters Protection Act, Government of Canada.

Freedom of Information and Protection of Privacy Act, 1999, Province of Alberta.

Highway Traffic Act, 1999, Province of Alberta.

Historical Resources Act, 1997, Province of Alberta.

Municipal Government Act, 1999, Province of Alberta.

Public Highways Development Act, 1994, Province of Alberta.

A Policy on Geometric Design of Highways and Streets, 2001, AASHTO.

Alberta Primary Highway Traffic Volume and Vehicle Classification, Travel & ESAL Report, Alberta Transportation.

Alberta Primary Highway Traffic Volume History Report (1991-2000), 2001, Alberta Transportation.

Alberta Traffic Collision Statistics, Alberta Transportation.

American Association of State Highway and Transportation Officials (AASHTO) - Provisional Standards and Volume II Test, 1995, AASTHO.

Benefit Cost Analysis (Summary, Guide and User Manual), 1991, Alberta Transportation.

Drafting Guidelines (CB4), July 1995, Alberta Transportation.

Environmental Protection Guidelines for Roadways, Province of Alberta.

Geometric Design Guide for Canadian Roads Part 1 & 2, 1999, TAC.

Highway Capacity Manual (Transportation Research Board), 2000, TRB, FHWA, USA.

Highway Geometric Design Guide, 1999, Alberta Transportation.

ITE Trip Generation Manual (5th Edition), 1991, ITE.

Manual of Uniform Traffic Control Devices for Canada, 1996, TAC.

Survey Manual, 1998, Alberta Transportation.

Urban Supplement to the Geometric Design Guide for Canadian Roads, April 1995, TAC.

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SECTION 3 - RIGHT-OF-WAY

3.1 BASIC RIGHT-OF-WAY REQUEST

3.1.1 GENERAL

For projects requiring the acquisition of right of way the Consultant shall prepare a "right-of-way" request document detailing "any" or "all" property requirements for the project.

Generally, the Project Sponsor will identify the need for a right-of-way request by specifying this work in the project Terms of Reference. For projects involving a planning study, the Consultant hired to do the study may be asked to prepare the basic right-of-way request under the Terms of Reference for that project.

The basic right-of-way request (see Appendix "D") must include all right-of-way requirements shown relative to existing land parcels as follows:

1. Highway basic right-of-way width
2. Proposed service road right-of-way (if required)
3. Proposed intersection improvement right-of-way (if required)
4. Optional purchase of isolated cut-off-areas
5. Area calculations from each certificate of title

Prior to issuing the basic right-of-way request, the Consultant shall review the following items:

1. Land titles and registered survey plans are checked to ensure that the existing property boundaries are shown correctly on the mosaics.
2. The planning report is reviewed for access requirements, intersection improvements, cut-off areas, creek diversions, existing developments, replacement of service road dedications, etc.
3. Land ownership as shown on the mosaics is updated as per current land titles. The date of title search shall be shown on mosaics under the title block. Subdivisions are plotted on mosaics.

3.1.2 REQUEST DOCUMENTS

The right-of-way request document must address access closures, access consolidations, new access construction requirements, and any special measures for interim access. All right-of-way requests must be color coded (as to the type of request) in accordance with the Department's established format. See Appendix "D".

3.1.3 LEAD-TIME

A lead-time of 18 months is desirable (12 months minimum) for all right-of-way requests to allow sufficient time should expropriation be necessary. Longer lead-time may be required for projects through Federal jurisdiction (e.g. Indian Reserves, Military Installations, etc.) and urban centres.

3.1.4 RIGHT-OF-WAY FOR PROJECTS ON CROWN LAND

Upon approval by the Department, the Consultant shall prepare the provisional reservation affecting Crown Land. The Project Sponsor will review the application and submit the reservation to the appropriate authority. This work, when delegated to the Consultant, shall be done as early in the process as possible.

3.2 SUPPLEMENTARY AND FINAL RIGHT-OF-WAY REQUESTS

3.2.1 GENERAL

The Consultant shall prepare the supplementary (if required) and final right-of-way requests during the detailed design to address unforeseen factors such as:

1. Change in project limits
2. Additional scope of work
3. Expropriation proceedings which necessitate an increase or decrease from basic right-of-way (and which require finalization of right-of-way needs)
4. Excessive cuts and fills along the main alignment and for road allowances which require gradeline improvement
5. Sight distance or gradeline restrictions, which might necessitate changes in intersection location
6. Intersection modification requirements
7. Proposed borrow locations
8. Projects located near major urban centres (land parcels are smaller which results in higher price for land and numerous land owners to deal with)

To facilitate land negotiations with property owners, an early indication of earth borrow requirements is desirable. Coordination between the Consultant, Project Sponsor, and Property Agent can expedite this procedure. The Consultant is generally required to arrange for borrow agreements.

3.2.2 RIGHT-OF-WAY FOR PROJECTS ON CROWN LAND

A final right-of-way request is not required in the case of a new alignment, since provisional reservations will cover any extra taking. A final right-of-way request may be required along an existing facility, if a provisional reservation is not in place.

For conditions and application requirements for obtaining borrow on crown land, please refer to Section 4.5.2.

3.2.3 REQUEST DOCUMENTS

The right-of-way request document must also address earth borrow requirements, easements, backslope agreements, and general release of all demands. All right-of-way requests must be color coded in accordance with the Department's established format. See Appendix "D".

3.3 ACQUISITION OF RIGHT-OF-WAY

3.3.1 GENERAL

Land required for the project may be acquired by either the Department or the Consultant on a project specific basis as described in the project Terms of Reference. When being handled by Consultant, the Department may assist in negotiations with landowners. The Consultant's personnel responsible for land negotiations must hold a valid Alberta Land Agent's license and, preferably, have the International Right-of-Way Association SR/WA designation. When required, formal land appraisals are to be completed by personnel with Appraisal Institute of Canada AACI designation and expertise in right-of-way appraisal. The Consultant personnel shall arrange for appraisals to estimate land value and damages where required.

Alberta Transportation often uses land acquisition consultants to negotiate for land needed to improve highways. To improve the line of communication a process has been designed to encourage the landowners to phone the regional property managers rather than the MLA's. At an open house, the regional property managers will distribute a pamphlet outlining the land acquisition process and answer questions about property related issues. On the land consultant's first visit, a letter of introduction from the regional property manager as well as the pamphlet will be distributed to the landowner. The landowner is encouraged to contact the land consultant, and then the regional property manager should a dispute arise. The land consultant also needs to be aware of what flexibility he has in the engineering plans when negotiating with landowners.

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Private land is acquired by one of the following methods:

1. Offer to Sell
2. Section 30 Agreement
3. Full Expropriation

The most desirable method is the Offer to Sell. This is where the landowner voluntarily agrees to sell the required land at the price offered by the Property Agent. After construction, the right-of-way boundary is surveyed and if the area is greater than what is in the Offer to Sell, an adjustment payment is forwarded to the landowner.

If unable to obtain an Offer to Sell and if compensation is the only outstanding issue, the Property Agent may request the landowner to sign a Section 30 Agreement. By executing such an agreement under the Expropriation Act, the landowner gives up possession of the required right-of-way at a mutually agreed date, but reserves the right to have final compensation determined by the Land Compensation Board.

The last resort in acquiring right-of-way is Full Expropriation. In this situation the landowner refuses to sell the required land for reasons other than the price offered (for example, objection to the proposed alignment). The issue may go before an inquiry, at which time the Department must present sufficient evidence to justify the expropriation (financial compensation is dealt with at a later stage). In some cases, it can take up to a year from the date of the notice of intention to expropriate to the date when possession of the land is obtained.

For both Section 30 Agreements and Full Expropriation, the Consultant is responsible for supplying plans showing the final right-of-way requirements from the subject properties. Special care must be taken in confirming the final right-of-way requirements since it can be difficult and sometimes impossible to obtain additional right-of-way at a later date. This is especially true in the case of Full Expropriation. The Consultant shall refer to the Expropriation Act and the Department's "The Expropriation Process" documentation (available from Planning and Programming Branch) for details of the seven step process to be followed for expropriation.

3.3.2 TIMING

For projects in the three-year plan, any outstanding land requirement shall be fully negotiated by the Consultant.

For projects that are currently identified on the ten-year program, but beyond the next three years, no active right-of-way (ROW) negotiation is normally undertaken unless

the functional plan has sufficient detail to identify ROW requirements, and there is a 'willing seller.' In rough terrain, ROW acquisition shall normally be delayed until design consultants are retained. In very sensitive areas such as near urban centres where development is possible, it may be necessary to do preliminary survey and design in very selective locations only, to allow right-of-way to be purchased in advance of the usual schedule.

For projects that are programmed for construction beyond ten years, it would be very unlikely that ROW purchasing would proceed. In those cases where ROW is recommended to be purchased, Deputy Minister approval shall normally be obtained. A full briefing would be required to support the recommendation to purchase the ROW. Where the functional plan is not felt to be of sufficient detail, then preliminary survey and design in very selective locations may be necessary.

Any change to the functional plan or design considered during ROW negotiations (such as changing the median spacing to minimize the required ROW to appease a landowner so that construction can proceed) shall be referred to the Project Sponsor. Approval from the Assistant Deputy Minister of Transportation and Civil Engineering Division will be acquired by the Project Sponsor prior to proceeding with negotiation.

3.3.3 SPECIAL CONSIDERATIONS FOR FEDERAL LANDS

Additional time may be required for Right-of-Way acquisition on Federal Lands because of the greater complexity of the process. Each project should be assessed on its own merit and dealt with accordingly.

3.3.4 APPROVALS REQUIRED

All land purchases and borrow agreements shall be referred to the Property Manager for approval. All right-of-way shall be obtained prior to proceeding with tender, unless otherwise approved by the Project Sponsor.

3.4 LEGAL SURVEY

3.4.1 GENERAL

The Consultant shall be responsible for the Legal Survey of the right-of-way acquired as related to the project and shall supply and install associated materials to complete the work. Legal Survey shall be done by a registered Alberta Land Surveyor.

SECTION 3 – RIGHT-OF-WAY

The Consultant shall carry out the Legal Survey in accordance with the provisions of the Surveys Act, the Land Titles Act, the Public Works Act and the “Land Surveyor’s Manual of Standard Practice”.

3.4.2 PERMISSION TO SURVEY

When doing any surveys for the Department, the Consultant shall consider the following:

Permission is normally obtained from the owner/leasee as a courtesy prior to entering or passing over private lands or public lands that are leased in order to undertake a survey. If cutting or clearing of trees or other vegetation is required for survey purposes, permission to do this work must be obtained from the landowner/leasee.

When surveying on Crown lands in the green zones, the Consultant must adhere to the requirements of the local forestry officials. When surveying on crown lands in the white zones, the surveyor shall obtain approval in writing from Public Land officials.

3.4.3 REFERENCING EXISTING SURVEY MONUMENTS

Key statutory monuments are to be identified and referenced prior to construction where there is a chance of monuments being destroyed during construction.

3.4.4 ALIGNMENT

In determining the final alignment and extent of the project, the Land Surveyor shall take into account the following:

1. Area purchased
2. Designed alignment and boundaries, including curve and deflection information
3. Area used for construction
4. Centreline of the final grade
5. Area fenced

The Consultant shall advise the Project Sponsor of any significant deviations before completing the survey.

3.4.5 POSTING BOUNDARIES (INSTALLING IRON POSTS)

The following shall apply when an Alberta Land Surveyor is doing road surveys for the Department.

- Roads 45.72 metres or less in right-of-way width need only be posted on one side.
- Roads more than 45.72 metres in width shall have both sides posted.
- In the case of road widening to be taken on the East/North side of the road allowance only, the East/North boundary of the widening is to be posted.
- All service roads within a primary highway will be posted and labeled as “service roads”.

3.4.6 PLAN PREPARATION

A Legal Survey plan, if required, shall be in a registerable format and will comply with all of the requirements as stated in the Land Titles “Policy and Procedures Manual for the Submission of Digital Plans of survey for Registration.” A copy of this manual is located on the following web site:

<http://www2.gov.ab.ca/gs/pdf/ppman.pdf> (as of December 2001)

Headings for plans prepared for the Department are to include:

- The nature of the plan, e.g. “Plan showing Survey of Public Work (Road), Stockpile Site” etc., as delivered by the Public Works Act.
- The file number of the Department, preferably at the bottom right-hand corner of the plan (e.g. “AT File No. _____”).
- Affidavit for the plan prepared for the Department along with a copy of the plan of survey shall be submitted to Alberta Transportation for review and execution.

3.4.7 AT AFFIDAVIT FOR ACQUIRING LANDS

One of the following affidavits will apply, depending on whether the lands were acquired by agreement or expropriation.

Current References for Section 3:

Expropriation Act, 1996, Province of Alberta.

Historical Resources Act, 1997, Province of Alberta.

Land Surveyor's Manual of Standard Practice, April 1996, Alberta Land Surveyor Association.

Land Titles Act, 1999, Province of Alberta.

Public Lands Act, 1998, Province of Alberta.

Public Works Act, 1996, Province of Alberta.

Surveys Act; Survey Regulation (Alberta Regulation 94/2000), 1999, Province of Alberta.

The Expropriation Process, 1996, Alberta Transportation.

SECTION 3 – RIGHT-OF-WAY

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SECTION 4 - ENVIRONMENTAL CONSIDERATIONS

4.1 GENERAL

The Consultant shall comply with all current environmental legislation. Compliance with legislation includes but is not limited to, obtaining all the applicable permits, approvals, authorizations and monitoring of the project to ensure compliance with environmental conditions of construction.

The Consultant shall ensure that all Acts, Regulations, Environmental Protection Guidelines, Codes of Practice, and any other documents that pertain to environmental matters are complied with during the planning, preliminary engineering, design and construction of the project. Consultants shall become familiar with these documents and keep up-to-date with them. Consultants shall ensure that the responsibilities outlined in the ECO Plan Framework document are followed. Contractor's compliance with his ECO Plan should be documented on each weekly report for the project. Consultants shall familiarize themselves with regulatory requirements and timing needed to process applications and shall submit all appropriate applications accordingly.

Close contact with the appropriate field staff of the regulatory agency is strongly recommended to Consultants during all stages of the project.

The Consultant shall arrange for any Historic Resources Overview or Historic Resources Impact Assessment (HRIA) that may be required.

4.2 INTERGOVERNMENTAL CO-OPERATION

4.2.1 FEDERAL GOVERNMENT

Federal Departments have the mandate for ensuring that projects, in which the Federal Government has a decision making responsibility (fiduciary duty), are appropriately handled. Contact with appropriate Federal Government Departments (Fisheries & Oceans Canada, Environment Canada) shall be initiated as soon as the project is awarded and shall be maintained to ensure that all environmental requirements (e.g. authorizations, decisions, advisory letters) are addressed. Specific attention is required for all watercourses, wetlands and migratory bird habitat.

SECTION 4 – ENVIRONMENTAL CONSIDERATIONS

4.2.2 PROVINCIAL INTERDEPARTMENTAL REFERRALS

Provincial Departments have the mandate for regulating surface disturbances on private and Provincial Crown Land and all water throughout the Province.

In order to coordinate a provincial response for highway and bridge construction projects, an interdepartmental referral system has been implemented. All referrals shall be directed to:

Roads and Reclamation Unit
Land Use Management Branch
Land Administration Division
Alberta Sustainable Resource Development
3rd Floor S. Petroleum Plaza
9915 - 108 St., Edmonton
Tel. No. (780) 415-4643 Fax No. (780) 427-1185

It is **MANDATORY** that the referral occurs through all stages of a project. Contact shall be initiated as soon as a project is awarded to the Consultant and shall be continued up to the completion of the project. Close contact with the field staff of the regulatory agency is required during all stages of a project.

There are differing information requirements imposed by the regulatory agencies for the various stages of a project. The full details of the requirements should be confirmed through the Roads and Reclamation Unit. Examples of information requirements are included in Appendix "C".

All plans submitted during the referral process must contain sufficient information for the regulatory agencies to make informed decisions. Regulatory agencies include Alberta Environment, Alberta Sustainable Resource Development, and Alberta Community Development.

4.3 ENVIRONMENTAL COMPLIANCE

The Consultant shall ensure that all applications, for which they are responsible, are prepared and submitted to the appropriate regulatory agency responsible for approving the application. The information collection required in support of these applications shall be commenced well in advance of the application preparation and submission date.

SECTION 4 – ENVIRONMENTAL CONSIDERATIONS

It should be noted that it may take a considerable period of time before any permit, approval or authorization for environmentally sensitive areas is issued. The Consultant shall ensure that applications are submitted well in advance of the proposed tender date.

Copies of all permits, approvals, authorizations, etc. are to be included as part of the tender package or referenced in the Special Provisions of the Contract Tender (See Section 4.4 below).

4.3.1 ENFORCEMENT

Regulatory agencies have the authority through Acts and Regulations to proceed with enforcement actions. All legislation that protects the environment, including the Alberta Historic Resources Act provides for enforcement action against individuals and corporations that fail to adhere to conditions of construction.

4.4 SPECIAL PROVISIONS

Copies of all Environmental Approvals, Permits, Authorizations and other associated documents shall be included in the Plans Section of the tender document. Where the environmental documents indicate specialized work to be performed by the Contractor, the Special Provisions shall describe the work required, and shall describe the method of payment. Where the environmental documents indicate conditions that are beyond the scope of the Contractor's Work, the excluded conditions shall be clearly indicated in the Special Provisions.

4.5 CONSERVATION AND RECLAMATION OF TOPSOIL AND SUBSOIL

The Environmental Protection and Enhancement Act requires an operator to conserve and reclaim specified land, and unless exempted by the regulations, to obtain a Reclamation Certificate. Environmental Protection Guidelines (Information Letters) that address Roadways, Pits, Borrow Excavation, Disposal of Excess Soil Materials from Roadways, and Conservation and Reclamation Guidelines for Alberta have been developed by Alberta Environment. These documents are available from Alberta Environment through their website or through the Information Centre. Alberta Transportation has developed “Guidelines for Borrow Reclamation” to provide field level experiences for proper reclamation to be achieved.

SECTION 4 – ENVIRONMENTAL CONSIDERATIONS

The Consultant shall maintain close contact with the appropriate Reclamation Inspector for the duration of the project.

4.5.1 RIGHT-OF-WAY

During the project design stage the following procedures shall be followed on Alberta Transportation projects that contain a grading component.

The Consultant shall employ a soil specialist to perform a complete assessment of the topsoil within the highway right-of-way. The assessment must identify differences in the topsoil depths on the existing side slopes, ditches, and back slopes and any additional widening of the right-of-way. The topsoil assessment locations shall be shown on mosaic plans with the following information for each location:

- presence and depth of any organic layers on the soil surface (leaf litter (LFH) in well drained areas or peat (O) in poorly drained areas)
- topsoil horizon identification (Ap, Ah, Ahe, Ae)
- topsoil horizon depth
- colour of topsoil and underlying subsoil (usually a B horizon)
- any areas with potential topsoil handling problems, such as areas where colour change between topsoil and subsoil cannot be used as an accurate guide to topsoil stripping, poorly drained areas, and areas of saline or Solonetzic subsoil.

Soils shall be described according to the terminology outlined in the “Canadian System of Soil Classification”.

The Consultant shall design the project such that all topsoil (Horizon A) in the right-of-way is salvaged and redistributed within the right-of-way. All subsoil (Horizon B) (if suitable) in the right-of-way shall be used in the construction of embankments. Prior to undertaking the project design and drafting the contract special provisions, the Consultant shall liaise with the Department’s Project Sponsor and the local Reclamation Inspector for Alberta Environment to confirm actual requirements.

If the quantity of topsoil is such that additional areas are required for either interim stockpiling or final placement, the Consultant shall make the necessary arrangements for the additional areas. Other alternative Alberta Transportation owned sites (gravel pits) that are in the vicinity of the project and could accommodate the excess topsoil, may be considered. In these cases, the Consultant shall consult with the Project Sponsor to determine the availability of such sites and provide a cost estimate for hauling the topsoil material. The Consultant shall incorporate the soil survey data into the tender documents. Topsoil quantities shall be calculated and a plan developed for the interim stockpiling of topsoil during construction.

4.5.2 BORROW EXCAVATIONS

The Consultant must obtain permission from the appropriate Provincial Government agency before entering on, testing or operating a borrow excavation on Crown land.

Conservation of topsoil and subsoil material from a borrow excavation is mandatory. The haul road utilized to access the borrow excavation is considered an integral part of the borrow and must have the topsoil and subsoil treated in the same manner as the borrow.

4.5.2.1 Department Supply of Borrow

The Consultant shall prepare a pre-disturbance assessment of the proposed borrow as detailed in the “Pre-disturbance Assessments Procedures for Borrow Excavations for Road Construction”.

The Consultant shall prepare a post-disturbance assessment report for the area disturbed by operation of the borrow excavation as detailed in the “Post-Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Roadway Construction”.

4.5.2.2 Contractor Supply of Borrow

The Consultant shall ensure that pre-disturbance and post-disturbance assessments are completed by the Contractor for borrow that is supplied by the Contractor and ensure that reclamation criteria are met before accepting the borrows as complete.

4.5.2.3 Soil Specialist

On the advisement of Alberta Environment, the Pre-assessment and post-assessment of borrow sites shall be conducted by a soil specialist.

A soil specialist is an individual who is proficient in soil classification, land management and soil conservation practices and should have considerable experience in soil and vegetation impact assessment and problem diagnosis. It is recommended that the soil specialist be a graduate of a diploma or degree program in Applied Soil Science related to soil management and conservation. Membership in the Alberta Institute of Agrologists would be a definite asset.

Individuals with considerable demonstrated field experience with soil conservation and road building practices, but no formal post-secondary education related to soil management and conservation, may carry out the pre and post assessments under the supervision of a soil specialist.

4.6 CONTAMINATED SITES

If, during the course of any investigations or work the Consultant believes or has a reason to believe that any property may be contaminated by hydrocarbons or any other hazardous substance, the Consultant must immediately report the contamination to Alberta Environment, the Department's Property Manager, the Project Sponsor and the Environmental Section of Civil Projects Branch. Further direction will be given to the Consultant at that time.

4.7 HISTORICAL RESOURCES

The Consultant must arrange for a Historical Resources Overview (HRO) and, if directed, a Historic Resources Impact Assessment (HRIA) on any proposed disturbances (e.g. aggregate sources, ROW corridor, or borrow areas) unless advised otherwise. Referral to Alberta Community Development, Heritage Resource Management Branch is included as part of Section 4.2.2. Deviation from the plans submitted under Section 4.2.2 will require a direct submission to Alberta Community Development for permission to undertake construction.

4.8 ENVIRONMENTAL RISK ASSESSMENT

The consultant shall complete a project environmental risk assessment as part of the detailed design work for all projects. These assessments shall identify any permanent and temporary measures required to protect the environment. Assessments shall be discussed with the Project Sponsor and incorporated into the contract bid items and special provisions if necessary. This is a minimum review and is expected to be brief.

Generic items may include but are not limited to:

- A list of permits/Authorizations that have been issued and conditions/restrictions imposed by each.
- Mitigation plans for each plan.
- A description of how borrow excavations are to be handled.

SECTION 4 – ENVIRONMENTAL CONSIDERATIONS

- A plan for erosion control during and after construction, including a schedule for winterizing sites if necessary, and for monitoring success of erosion control measures.
- A watercourse protection plan if required.
- A description of how the Horizon A and B layers are to be handled, including details of temporary and permanent stockpile locations. If surplus soil is anticipated, a description of how it will be handled.

4.9 WEED PREVENTION

A weed survey should be completed along the right-of-way and for all borrow excavations prior to the commencement of activities to establish a bench mark for post-activity assessment. The land owner or land manager should be advised of the presence of restricted, noxious and nuisance weeds that are listed in the *Weed Regulation*. The location of restricted and noxious weeds should be clearly delineated, appropriate control measures put in place to destroy all restricted weeds, control noxious weeds and prevent the scattering of nuisance weeds.

The Weed Act also states that the movement of a machine or vehicle is prohibited if the movement is likely to cause the spread of a restricted, noxious or nuisance weed. Equipment, materials and vehicles exposed to weeds should be cleaned prior to leaving an infested site.

5.0 REPORTING REQUIREMENTS

Copies of all correspondence and the original of all permits, Approvals, Authorizations, etc. must be submitted to the Project Sponsor or Co-Sponsor (as appropriate) with a copy to the Manager, Transportation Projects, Environmental Section, Civil Projects Branch. These documents will be reviewed and, where appropriate, the Department will assist the Consultant in any negotiations with the regulatory agency. The Consultant shall keep copies of all permits, Approvals and Authorizations for their records.

Copies of Pre-Disturbance and Post Disturbance Assessments prepared for borrow excavations are to be submitted to the Project Sponsor or delegate. The timing of submission is to be as follows: Pre-Disturbance Assessment to be submitted within one month of undertaking the assessment. The Post Disturbance Assessment is to be submitted within one (1) month of the completion of the reclamation of the borrow excavation. Additional follow-up Post Disturbance Assessments may be required subject to the conditions detected during the initial post-disturbance assessment.

SECTION 4 – ENVIRONMENTAL CONSIDERATIONS

Current References for Section 4:

Canadian Environment Assessment Act, Government of Canada.

Canadian Environment Protection Act, 1999, Government of Canada.

Canada Fisheries Act, Government of Canada.

Canadian System of Soil Classification, 1987, Agriculture Canada.

Canada Transportation Act, Government of Canada.

Migratory Birds Convention Act, Government of Canada.

Navigable Waters Protection Act, Government of Canada.

Environmental Protection and Enhancement Act, 1998, Province of Alberta.

Forest and Prairie Protection Act, 1994, Province of Alberta.

Forests Act, 1996, Province of Alberta.

Guide to Reclaiming Borrow Excavations Used for Road Construction May 2002

Historical Resources Act, 1997, Province of Alberta.

Pre-disturbance Assessment Procedures for Borrow Excavations for Road Construction May 2002

Post Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations for Road Construction May 2002

Public Lands Act, 1998, Province of Alberta.

Soil Conservation Act, 1988, Province of Alberta.

Water Act, 1999, Province of Alberta.

Weed Act, Province of Alberta.

Wildlife Act, Province of Alberta.

Borrow Excavations C & R/IL/00-3, 2000, Alberta Environment.

Code of Practice for Asphalt Paving Plants, 1996, Alberta Environment.

Code of Practice for Watercourse Crossings, 2000, Alberta Environment.

Conservation and Reclamation Guidelines for Alberta C & R/IL/97-1, 1997, Alberta Environment.

Disposal of Excess Soil Material from Roadways C & R/IL/00-10, 2000, Alberta Environment.

Environmental Protection Guidelines for Pits C & R/IL/96-5, 1996, Alberta Environment.

Environmental Protection Guidelines for Roadways C & R/IL/00-5, 2001, Alberta Environment.

Environmental Self-Assessment of Rail Infrastructure Projects, Draft July 2001, Canadian Transportation Agency.

Erosion Control Reference Material, 2001, Alberta Transportation.

Fish Habitat Manual, 2001, Alberta Transportation.

Navigable Waters Protection Act Procedure Manual, 2001, Alberta Transportation.

SECTION 4 –ENVIRONMENTAL CONSIDERATIONS

Alberta Transportation Pre-Disturbance Procedures for Borrow Excavations for Road Construction, 2002, Alberta Transportation.

Alberta Transportation Post-Disturbance Criteria and Assessment Procedures for Borrow Excavations for Road Construction, 2002, Alberta Transportation.

Alberta Transportation Guide to Reclaiming Borrow Excavations Used for Road Construction, 2002, Alberta Transportation.

SECTION 5 - ENGINEERING ASSESSMENT

5.1 GENERAL

NOTE: Engineering Assessments are not normally included as part of a Design/Construction Supervision engineering assignment, however, if they are, this will be stated in the Terms of Reference for the assignment.

To facilitate an accurate and stable program development process, the Department generally undertakes engineering assessments on projects or segments of highways approximately 3 - 5 years in advance of construction. Ideally engineering assessments of roadways and bridges are completed prior to issuing a Terms of Reference for the detailed design/ construction supervision of a project. Roadway Engineering Assessments generally involve some or all of the following tasks (which are described in greater detail later in this chapter): Geometric Assessment, Safety Assessment, At-grade Railway Crossing Assessment and Applications, Assessment of the need for Illumination, Traffic Signals & Pedestrian Crossing Signals, Traffic Studies, Surfacing Strategy and Basic Pavement Structure Design, Seal Coat Assessment. Roadway Engineering Assessments are normally done under the Roadway Preliminary Engineering Assignments agreements however in some cases this work may be done by a different consultant or included in the Terms of Reference for the design/construction supervision engineering agreement.

The fundamental parameters that are normally established at the planning/engineering assessment stage are as follows:

- Design speed, Posted speed.
- Design Designation (surface width, overlay acceptable or widening required)
- Geometric Improvements needed
- Lighting (warranted or not)
- Traffic Signals (required or not)
- Safety Improvements
- Bridge Requirements and Assessments
- Railway At-grade crossings (improvements warranted or not)
- Surfacing Strategy and Basic Pavement Structural Design.

A more comprehensive description of engineering assessment information is provided in the following pages.

The purpose of an Engineering Assessment is to ensure that an appropriate amount of engineering is undertaken to identify, prioritize, and determine the scope of projects before detailed engineering work is undertaken. This is also an opportunity to build consensus on safety, engineering and programming strategies.

5.2 ROADWAY ENGINEERING ASSESSMENTS

5.2.1 GEOMETRIC ASSESSMENT

For projects which involve pavement rehabilitation and/or geometric improvements on existing paved roadways, geometric assessment of the existing roadway may be undertaken. Geometric assessment is generally done as an assignment under the Regional Preliminary Engineering Agreement. Alternatively Geometric Assessment may be done as a first step with Preliminary Engineering of a detailed design project. The level of detail and type of analysis required in a geometric assessment depends on the nature and cost of the work being considered. Additional information is contained in Chapter G of the “Highway Geometric Design Guide” and the Terms of Reference for Roadway Preliminary Engineering Regional Assignments. The assessment shall result in identification of geometric elements of existing infrastructure which warrant improvement based on consideration of total societal costs and benefits and 3R/4R Guidelines. The Geometric Assessment Final Report is generally used to prepare the Terms of Reference for detailed design.

A Geometric Assessment is a review of existing geometric, traffic and operational conditions, including but not limited to the following:

1. Geometric information

- design designation
- horizontal alignment
- vertical alignment
- intersection geometry
- cross-section elements
- sight distances
- superelevation
- climbing/passing lanes
- railway crossings
- guardrail
- roadside hazards in clear zone
- horizontal and vertical clearances to structures
- roadside auxiliary developments (historical turn-outs, view points, litter box turn-outs, etc.)
- passing opportunity (based on pavement marking and traffic)
- functional classification system
- access management
- rumble strips
- highway illumination
- traffic signals

- pedestrian traffic control
 - culvert
 - noise attenuation devices
2. Traffic information
- traffic volume, hourly and daily
 - traffic composition (vehicle types)
 - turning volumes at major intersection
 - level of service
 - pavement markings
 - posted speed, general and advisory
 - running speed (85th percentile and average)
3. Collision experience
- collision records for previous 5 years
 - records of special monitoring locations
 - breakdown of non-animal and animal collisions
 - collision types
 - collision severity
4. Other information (catalog of locations)
- utilities (catalog the existence of all buried and above ground utilities)
 - culvert conditions
 - signing and traffic signals (catalog)
 - illumination (catalog)
 - geotechnical information (landslides)
 - noise attenuation devices (catalog of existing devices)

Much of the above information is available through existing records at the Department offices in the Twin Atria building. Some information, for example superelevation rates on existing curves and intersection sight distances available at intersections, can only be measured accurately from an on-site survey. A full survey (e.g. preliminary survey) is not required at the engineering assessment stage, however, a limited amount of survey work may be needed to check existing cross section elements (e.g. sideslopes), guardrail, existing intersection configuration, culvert condition, existing pavement width, roadside hazards, utility and illumination.

The 3R/4R Geometric Design Guidelines (Chapter G of the Department “Highway Geometric Design Guide”) are used for geometric analysis on existing paved roadways. The Consultant investigates and makes recommendations on the need for upgrading or on the suitability of existing geometrics, particularly roadway width, horizontal and vertical alignment, intersections, auxiliary lanes, roadside slopes, turnouts, climbing lanes etc.

SECTION 5 – ENGINEERING ASSESSMENTS

5.2.2 SAFETY ASSESSMENT

The term “Safety Assessment” is normally used to describe an engineering task undertaken by the Regional Roadway Preliminary Engineering consultant. This is defined in detail in the Terms of Reference for that project however a brief description is given here for general use.

Safety Assessments are normally focused on a particular operational problem occurring at a defined spot location such as an intersection, interchange, curve or bridge or on a highway segment. The problems that require assessment may be identified through a review of collision experiences throughout the province or may be identified by members of the public, municipal officials, Department management or elected representatives.

The Safety Assessment involves a detailed review and analysis of the collision history, particularly a breakdown of collision types and rates in conjunction with a review of the existing geometric parameters and traffic control devices. Through this review it is possible to identify appropriate types of improvement to best meet the needs of road users and the Department. Low cost opportunities can be taken to improve safety at particular locations where the cost of major upgrading is not justified or warranted. Examples of low cost measures are signing, chevrons, pavement markings, rumble strips, animal reflector posts, etc. Where major improvements are warranted, the extent of these improvements together with the estimated capital cost and internal rate of return for the improvement shall be provided. The internal rate of return shall be calculated according to the Department’s “Benefit Cost Analysis” guide considering total societal costs and benefits over the life of the project. The preliminary cost information may be used by the Department to rank various proposed safety improvements and decide on the timing of each project.

The assessment shall result in identification of key safety improvements at selected locations to be applied generally to highways which are warranted for improvements based on cost-effectiveness, collision experience and engineering judgment.

The Department has compiled a five-year historical record of the safety performance of all single and double digit Provincial highways to identify operational problems at both spot locations and along segments of highways. Summaries of collision data for primary highways are available from the Department.

5.2.3 AT-GRADE RAILWAY CROSSING APPLICATIONS

An engineering assessment of an at-grade railway crossing may be undertaken by the Regional Preliminary Engineering consultant under the terms of their agreement with the Department or this work can be undertaken under a separate arrangement. The Terms of Reference for Regional Roadway Preliminary Engineering Agreements provide detail of what is required in these assessments.

Where an existing public at-grade railway crossing is under consideration for safety improvements, the crossing must be assessed to establish the need to improve and decide on an appropriate type of treatment. This assessment generally involves consultation with all parties involved especially those who may be cost sharing on the improvement. The initial assessment generally includes an on-site joint inspection.

Where there is general agreement that safety improvements should be made at an existing public at-grade crossing, a formal application must be prepared and submitted to Transport Canada, the Railway Company and any other party involved as per current federal regulations. Transport Canada Railway Safety Directorate should be contacted during the preliminary engineering stage. Public at-grade railway crossings on national railways (such as CPR and CNR) are under federal jurisdiction. Improvements to existing crossings or construction of new ones require not only agreement from affected railway companies but also adherence to federal guidelines and standards.

If the proposed road work will significantly affect a railway crossing, the railway company shall be consulted in a timely manner for their review of potential impacts to their operations and engineering requirements, and for a cost estimate. Railway input especially on drainage treatment, planking material, utilities and signal hardware placement is also needed to avoid potential conflicts, costly re-construction or delays in awaiting for an agreement.

At the time of writing there is no requirement to make a submission to the Canadian Transportation Agency regarding environmental impact however there is a draft document under development entitled “Environmental-Self Assessment of Rail Infrastructure Projects”. For the latest status on this document, please contact the Rail Infrastructure Directorate, Rail and Marine Branch, Canadian Transportation Agency.

Since certain railway safety improvements (signals, sight line improvements, etc.) are partially funded by Transport Canada and the Railway Company, application for improvements shall be submitted well in advance as the approval process can take up to 18 months. If Transport Canada is not cost-sharing, there is no need to submit an application to them. If a cost-apportionment dispute develops and a submission to C.T.A. for resolution is made, a turn-around time of 90 days should be expected.

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A general review of traffic, train volumes and the safety record of the crossing will also help determine the need for signals and other protection works.

The “Road/Railway Crossing Guidelines” (prepared by the Department in May 1997 and available from Business Management Branch) for at-grade crossings and grade separations should be followed for the preliminary engineering assessment and application.

5.2.4 ROADWAY APPURTENANCES: (HIGHWAY LIGHTING, TRAFFIC SIGNALS, PEDESTRIAN CROSSING CONTROL)

The assessment of the need for installation or upgrade of existing highway appurtenances is frequently required at the engineering assessment stage of a design project and may also be required as part of an operational review on an existing in-service highway. For this reason, the analysis of the need for Highway Lighting, Traffic Signals and Pedestrian Traffic Control have been included as standard tasks that may be undertaken on a “fee-for-service” basis under the current Regional Preliminary Engineering agreements. These tasks may also be undertaken by other engineering consultants under separate agreements where appropriate. A detailed description of these tasks is given in the Terms of Reference for Preliminary Engineering and is repeated here for general use.

5.2.4.1 General

Alberta Transportation receives a number of requests from municipalities and the general public regarding the installation of traffic control devices such as highway lighting, traffic signals and pedestrian crossings control at selected locations throughout the province. These requests usually require an investigation of existing traffic data, a warrant analysis and good traffic engineering judgment to assess the required need. A warrant analysis is used to compare the operation, safety and uniform application of highway lighting, traffic signals and pedestrian crossing control with other locations in the province. However, the warrant calculation (number of priority points obtained) is not absolute and requires sound engineering judgment on the safety and operational implication of installing the traffic device. The use of warrants for street lighting, traffic signals and pedestrian crossing control is necessary to develop consistency in prioritizing of installation / upgrading / maintenance of these traffic devices. A warranted application also promotes drivers’ compliance with traffic control devices that could help solve operational safety problems.

5.2.4.2 Scope Outline

The following general steps are required to assess whether highway lighting, traffic signals or pedestrian crossing protection devices are warranted.

1. Review background information relating to the intersection. This information can be requested through the Project Sponsor and Central Records.
2. Review current operations with the Regional Operations Manager, Operations Engineer, Maintenance Contract Inspector or other Department staff.
3. Review with appropriate stakeholders involved (for example, discuss with school administration if the request is a pedestrian crossing in the vicinity of a school).
4. Public consultation is not normally required as part of the assessment.
5. Obtain the most recently available collision summary from Safety Services. Review collision types to ascertain whether the requested traffic control would address the collision type.
6. Alberta Transportation will provide access to traffic information for the analysis. If traffic information is unavailable, or if a manual count has not been undertaken within the previous three years, an up-to-date traffic count would be desirable. A traffic count, if required, is generally done through existing contractors (under contract to the Department) however in some cases a special count may be done by the consultant using Departmental procedures (if specifically requested by the project sponsor).
7. Obtain aerial photos, maps, plans, drawings, etc. to determine the geometry and development in the area. Note other sources of signals and lighting in the area.
8. Undertake a site reconnaissance, observing the overall operations at the location, at an appropriate time. Note that an examination of the site may be required during darkness (e.g. for illumination).
9. Undertake warrant calculation using appropriate warrant procedure.
10. Assess other various options, including lower cost alternatives such as other intersection improvements possibly relating to other traffic control devices, lane markings, delineation, minor geometric adjustments, etc., to address the problem, and possibly postpone the need for traffic signals and/or lighting.

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11. Provide an estimate of costs for the suggested traffic control scheme, including other possible low-cost alternatives for better operations.
12. The Department specifications for materials used in lighting should also be compatible with the standards set by the industry. This will ensure that service equipment used will serve both old and new lighting systems and that the replacement material is readily available.
13. Report the results of the engineering assessment in a draft document for review by the Project Sponsor and others.
14. Modify draft report to include Project Sponsor's and others comments.

Turning Movement Diagram or speed data collection may be required at selected sites based on a request from the Project Sponsor.

5.2.4.3 Warrant Analysis

The following publications are generally used in calculating the warrant for each type of traffic control: (A sample of each warrant calculation sheet is provided in Appendix #6 of the Preliminary Engineering Terms of Reference for information purposes).

1. Manual of Uniform Traffic Control Devices of Canada (4th Edition), September 1998 - Transportation Association of Canada
 - Traffic signals are considered at 80% of TAC's requirement (80 points).
 - For high-speed intersections, no priority points added or taken away for collisions (part 1 of calculation is in Fig B2-6) of the MUTCDC. An engineering review is conducted on the collision data, separate from the warrant point calculation.
2. Pedestrian Crossing Control Manual, Transportation Association of Canada (March 1998)
 - The Department generally follows the hierarchy of pedestrian crossings outlined in the TAC guide.
3. Illumination of Isolated Rural Intersections, TAC (February, 2001)
 - New guide outlining three types of highway lighting: full, partial, and delineation lighting. Warrant calculation suggests the type of lighting required, but good engineering judgment is also needed.

- The number of lighting projects and the priorities in which they will be undertaken in any given year will be determined by the Department considering available capital funding and normal programming practices.

5.2.5 TRAFFIC DATA: (TURNING MOVEMENT STUDIES, TRAFFIC SPEED DATA COLLECTION)

Alberta Transportation frequently requires traffic data for planning, engineering assessment and detailed design purposes. The Department maintains an extensive database of current information and retains the services of a consulting engineering company to collect new information as required. In the event that the Department cannot use the normal processes to obtain/compile the required data, alternate methods are used. For this reason the current Regional Preliminary Engineering agreements have provisions to allow traffic data to be collected on a “fee-for-service” basis. The Terms of Reference for the preliminary engineering agreement provides details of the requirements for traffic data collection. The information is repeated here for general use. Traffic data collection may be required on any project if requested by the Project Sponsor.

5.2.5.1 General

Alberta Transportation is the authority responsible for the setting of speed limits on provincial highways. Often to assist with the setting of speed limits on various highway sections, special traffic speed data collection is required at selected sites to determine speed and turning movements. The following section provides details of turning movement and speed data requirements.

5.2.5.2 Turning Movement Studies

The following steps are to be followed to acquire data on Turning Movements Studies for engineering assessment and other purposes.

1. The number of and location of intersections on the highway segment being assessed should be determined.

The Alberta Transportation web site

<http://www.tu.gov.ab.ca/Content/doctype181/production/hnp003.htm>

(as of December 2001) should be accessed to see if current traffic volume data is available for the intersections determined in step 1.

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2. There is information available for over 1900 intersections in Alberta. The Turning Movement Summary Diagrams web site as of December 2001 is as follows:
<http://www.tu.gov.ab.ca/Content/doctype181/production/hnp007.htm>
3. If an intersection is not available on the web site the consultant should check with the local municipality to see if the local road intersecting with the provincial highway has been counted.
4. If an intersection has no traffic information the consultant should determine if a turning movement study is warranted. The rough guidelines for this are that the average annual daily traffic (AADT) on the provincial highway should exceed 1000 and the average annual daily traffic (AADT) on the intersecting road should exceed 200. Reference Alberta Transportation's Highway Geometric Design Guide Figure D-7.4.
5. The Department provides AADT volume data for all primary highways which can be found on the following web page:
<http://www.tu.gov.ab.ca/Content/doctype181/production/hnp003.htm>
(as of December 2001)
6. The volume on the intersecting road can be estimated by knowing the local land use, recreational and industrial activity. Trip generation rates for various land uses are available in the ITE publication Trip Generation, Sixth Edition, Publication Number IR-016D
7. Once it has been determined that an intersection traffic study is required the consultant shall request authorization from the Project Sponsor to undertake the study. If authorized, the consultant shall do the study following the procedures outlined in the Alberta Transportation Turning Movement Training Manual (See Appendix #8).
8. When this work is done under a Regional Roadway Preliminary Engineering agreement, there will be a separate "fee for service" for this task.
9. At the completion of the study the data collected must be transferred from field sheets to a spread sheet in an Alberta Transportation approved electronic medium. As of December 2001, the format is a Microsoft EXCEL 97 file stored onto a IBM/DOS formatted 3.5 " floppy disk or CD.
10. This spreadsheet shall be sent to Alberta Transportation's approved consultant for factoring to annual statistics. For information on the Department's current traffic factoring consultant, please contact the Forecasting Engineer in Highway Asset Management Section, Program Management Branch.

11. The consultant shall pay for factoring the traffic data to annual statistics and bill it back to Alberta Transportation under the assessment agreement.
12. The Turning Movement Study is not completed until the factored data is presented back to the Project Sponsor in the required format.

5.2.5.3 Speed Data Requirements:

The consultant may choose to collect spot speed data by a reliable method as they see fit. This may be done through manual observations using a radar device, or through the placement of portable equipment to automatically record vehicle speeds (Nu-Metrics Hi-Star for example).

For automatic speed data sampling, a minimum of 24 hours of data are required for each travel direction. The consultant shall adhere to the Department's traffic accommodation guidelines when installing or removing devices from the highway lane.

For manual speed data sampling, a minimum of 4 hours of observation is required with a minimum number of representative speed samples taken within this period. The minimum number of speed samples taken for each travel direction must meet the minimum sampling requirements for the observations to be statistically viable. For low volume roads, it may be necessary to extend the 4 hours of observation to attain a minimum sample requirement. Periods of inclement weather, poor driving conditions and congested periods, which may alter the speed results should be avoided.

The following information is required for speed data:

1. Highway Number, Control Section and Kilometre
2. Date and Day of Week
3. Location Description
4. Start and End Times
5. Sampling Scheme (as indicated on the request)
6. General Weather and Wind Conditions
7. Posted Speed and Limit of Speed Zone
8. Direction of Traffic being Monitored
9. Lane Observed
10. Vehicle Number (number of sampled observations with recorded speed)
11. Road Surface Type and Condition.

The consultant is responsible for performing a statistical analysis of the raw spot speed data, including mean speed, 85th percentile speed, median, mode (most frequently occurring speed) and 15 km/h pace (15 km/h interval having the most occurrences). The results must be included in a graphical format.

5.2.6 REPORTING REQUIREMENTS

A written report is required for all engineering assessments for each roadway project, unless this is specifically excluded in the Terms of Reference. The report will include a copy of the completed geometric assessment or other relevant checklist, supporting documents such as reproduced existing Department drawings (if available) or new drawings showing the geometric and other pertinent information, and recommendation for improvement. As a minimum, these drawings shall show horizontal alignment, vertical alignment, cross-section elements and details of all major intersections. Other pertinent information shall also be shown. The information on geometric improvement needs shall be provided in electronic and hardcopy format (graphics in Microstation format) that can be used for a Terms of Reference for detailed design and construction supervision components of the work.

A relatively detailed construction estimate shall also be provided in the report. This estimate shall be more precise than an “A” (programming) Estimate since adjustments would have been made for all of the identified geometric improvements.

Draft reports should be sent to the Project Sponsor with a copy to the Technical Standards Branch for review. Comments from the Department should be taken into consideration before finalizing the reports. Departmental acceptance is required for all engineering assessment reports due to the cost implications to the construction program. Refer to section 2.8 for details of reporting requirements.

The Consultant may be required to participate in an engineering assessment completion meeting if issues arising from their submission cannot be satisfactorily resolved.

5.3 SURFACING ENGINEERING ASSESSMENT

5.3.1 SURFACING STRATEGY AND BASIC PAVEMENT STRUCTURAL DESIGN

The Department develops on an ongoing basis a Multi-Year Construction and Rehabilitation program. This program identifies on a yearly basis the projects which are proposed for construction on the provincial highway network. Construction programming is a continuous process and is subject to revisions due to changing circumstances in terms of projected expenditures, current budget levels and technical needs.

Since surfacing strategy has major cost implication for construction projects, it is important that an appropriate amount of engineering assessment is undertaken to

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identify the scope of work prior to detailed engineering. Generally, this is done by the Department's Regional Consultant as an assignment under the Preliminary Engineering Regional Assignment and included in the Terms of Reference for detailed design.

The current Roadway Preliminary Engineering Regional Assignment agreements include Surfacing Strategy and Basic Structural Design for new construction (base and paving), final paving and rehabilitation projects which are scheduled for detailed design and subsequent construction. The work shall be done in general accordance with the Department's "Pavement Design Manual" published in 1997.

The project tasks shall consist of the following:

1. Obtain from AI design inputs such as project description and limits, traffic, planning report, mosaics, soil logs, as-built pavement structures, pavement evaluation data [Falling Weight Deflectometer (FWD), International Roughness Index (IRI), Riding Comfort Index (RCI), and Rut measurements], as applicable.
2. The consultant's designer shall conduct and document a detailed field reconnaissance for all projects. The field reconnaissance shall be carried out in accordance with Section 2.5 of the Pavement Design Manual.

For existing grades (base and paving projects) it may be necessary for the consultant to undertake a field reconnaissance to confirm the existing grade width and subgrade condition if this information cannot be obtained from Department records.

3. Carry out the analysis and interpretation of FWD testing data in accordance with the Pavement Design Manual.
4. Carry out design to establish basic pavement thickness, material types, alternate treatments such as Hot In-Place Recycling (HIR), cold mill and inlay, etc.
5. For establishing that a project may be a suitable candidate for HIR, a review of past construction records and pavement condition data shall be carried out. Detailed field coring and laboratory evaluation program for evaluating HIR will be outside the scope of this sub-assignment.
6. For rehabilitation projects, the consultant shall include surfacing strategy(ies) for any geometric improvement elements as identified by a geometric assessment provided by the Department. These elements may include widening, intersections, climbing lanes, access roads and reconstruction.

In cases where a geometric assessment has not been carried out for a rehabilitation project the consultant shall confirm that finished widths meet the requirements of

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the Department's 3R/4R guidelines. If widths will not meet the 3R/4R guidelines, direction shall be sought from the Project Sponsor.

Prepare a detailed report. The report shall include, as a minimum,

- All pertinent design inputs (ie: existing structure, traffic, soils characteristics, etc)
- Site photos to illustrate general roadway condition and typical condition of distresses such as cracking.
- Site plan showing project limits.
- Detailed field reconnaissance notes identifying specific distress areas and other observations supporting design recommendations.
- Discussion of the inputs used to arrive at the design recommendations and the rationale used in selecting the recommended design strategy.
- Typical cross section drawings for the recommended pavement design strategy.
- Graphical presentation of calculated moduli, overlay needs, rut and roughness data, and existing cross sections.
- Recommended surfacing strategy(ies) and basic structural including any special requirements such as pre-treatment of existing cracks.
- Prepare a 'B' type construction estimate based on the recommended surfacing strategy and current construction costs. Multiple estimates may be requested to satisfy programming needs.

5.3.2 SEAL COAT PRIORITIZATION

There is a need to select those pavements which have the greatest need for seal-coat in order to optimize the effectiveness of the Department's annual seal coat program. This engineering assessment is generally done on a Regional basis under the terms of a Regional Preliminary Engineering Agreement. The Department will provide the Consultant a list of potential seal coat projects in a Region. The Consultant shall prioritize the projects on the list in accordance with the Department's "Guidelines for Assessment, Rating and Prioritization of Seal Coat". The procedure to be followed involves assessing potential seal coat projects from on-site inspection of the pavement condition, gathering input from the Region (i.e. Construction and/or Operations Managers), and application of a set of criteria to evaluate the needs of particular pavements.

5.3.3 REPORTING REQUIREMENTS

For Surfacing Strategy, the Consultant shall provide a design report (including methods of addressing rehabilitation requirements and cross-section drawing) in a similar format as contained in the “Pavement Design Manual”. The report shall also include a type “B” Estimate for the construction cost based on the recommended surfacing strategy.

For Seal Coat, the Consultant shall submit to the Project Sponsor a priority list for the construction year (arranged in order of highest to lowest priority) and all the scoring sheets used in the evaluation of the potential projects. The Consultant shall provide a unit cost estimate for each of the projects in the list.

5.4 BRIDGE ASSESSMENTS AND/OR BRIDGE PLANNING

The procedure to be followed for bridge assessment is covered in Section 10.10.1 and Appendix J1-4.

Current References for Section 5:

Benefit Cost Analysis (Summary Guide and User Guide and Manual), 1991, Alberta Transportation.

Environmental Self – Assessment of Rail Infrastructure Projects, 2001, Canadian Transportation Agency.

Guidelines for Assessment, Rating and Prioritization of Seal Coat, 1997, Alberta Transportation.

Highway Capacity Manual (Transportation Research Board), 1994, TRB, FHWA, USA.

Highway Geometric Design Guide, 1999, Alberta Transportation.

Illumination of Isolated Rural Intersections, 2001, TAC.

ITE Trip Generation Manual (5th Edition), 1991, ITE.

Manual of Uniform Traffic Control Device for Canada, 1996, TAC.

Pavement Design Manual, 1997, Alberta Transportation.

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Pedestrian Crossing Control Manual, 1998, TAC.

Public Highways Development Act, 1994, Province of Alberta.

Road/Railway Crossing Guidelines, 1997, Alberta Transportation.

Surveys Act; Survey Regulation (Alberta Regulation 94/2000), 1999, Province of Alberta.

Terms of Reference, Roadway Preliminary Engineering, Regional Assignments, (Geometric Safety & Traffic), 2000 – 2002, Alberta Transportation.

Terms of Reference, Roadway Preliminary Engineering, Regional Assignments, (Surfacing Strategy and Seal Coat Assessment), Alberta Transportation.

Traffic Control Standards Manual, 1996, Alberta Transportation.

Turning Movement Training Manual, 1994, Alberta Transportation.

AASHTO Pavement Guide, 1993, AASHTO.

SECTION 6 - PRELIMINARY ENGINEERING

6.1 GENERAL

The Consultant shall revise/update and/or undertake any of the following preliminary engineering tasks as stipulated in the Terms of Reference for the project:

6.1.1 BRIDGE PLANNING

Bridge Planning (sometimes referred to as Preliminary Engineering) for bridges is a distinct and different process compared to roadway preliminary engineering. This function is described in Bridge Planning Section 10.10 and Appendix J1 and it is generally independent of preliminary engineering. The timing and complexity of bridge planning is dependent on the type of bridge and crossing under consideration, however when the construction costs are expected to exceed \$1 million, it is normally undertaken 3 – 5 years in advance of the programmed construction date.

6.1.2 PROJECT SET-UP AND REVIEW EXISTING INFORMATION

The Consultant shall assemble and review all relevant information (i.e. existing design and project data) available from Alberta Transportation and shall plan a Preliminary Engineering Strategy based on this information. All acquired data from sources at Alberta Transportation and for this Preliminary Engineering phase shall be assessed with respect to its impact on the design.

6.1.3 INITIALIZATION MEETING

Prior to commencement of the work, the Consultant will attend a meeting with the Project Sponsor to discuss with him/her their work plan, scheduling, evaluation criteria and to review project files.

6.1.4 PRELIMINARY SURVEY

6.1.4.1 General Requirements

The Consultant shall complete a preliminary survey that will include:

- Title search
- Horizontal and vertical survey
- survey control points
- DTM modeling
- Survey transit notes

All surveys are to be tied to the Alberta Survey System NAD83 3TM Coordinates and survey closure accuracy shall be as follows:

- For general roadway work, the following survey closure accuracy shall apply:
 - vertical level circuit closure accuracy
allowable error (mm) = $12 \times \text{square root} [\text{distant of circuit (km)}]$
 - horizontal linear closure to within 1 in 5000
- For sensitive (critical) locations with very high accuracy requirements (e.g. bridge structures, curb & gutter, etc.), survey closure accuracy shall be suitably precise to comply with construction tolerances.

All surveys shall be carried out according to the Department's current procedures as shown in the latest manuals. At the time of writing the latest documents are the 1988 Survey Manual and the 1996 Guide to Electronic Survey and Data Management. The 1996 Guide provides specific information on work methods, procedures and practices which are to be followed for electronic survey activities required for highway work. In particular, the modules on Establishing a Control Network, Stake-Out, Data Pickup, Data Processing, Data Management and Final Quantities shall be followed by all Consultants unless an alternative method has been proposed by the Consultant and accepted by the Project Sponsor in advance of commencement of the survey.

6.1.4.2 Chainages

Chainages will begin on the south end of projects running in a general south-north direction and on the west end of projects running in a west-east direction. The chainage at the beginning of a project shall match the control section kilometre value at the same location. For example, if the km value is 10, the initial chainage is 10+000.

Twinning projects may require special chainage e.g. along centreline or independently along each roadway if they are independent alignments, however the same general convention should be followed where feasible.

NOTE: The 'km' is defined as the length along centreline from the beginning of the control section, with the south end of each control section being '0' on north-south alignments and the west end being '0' on east-west alignments. Alberta Transportation Control Section Numbering System and Kilometre Datum Measurement must be used.

6.1.4.3 Construction Control Points

Control points, as references for future stages of construction, shall (as required) be established at locations that will provide protection from damage or loss. The construction, location and marking of these control points shall be appropriate to ensure their integrity for the duration of the project. Steel Pins (min 45cm) are considered sufficient as control points. Brass caps shall not be used for construction control points due to possible confusion with legal survey markers.

The Consultant shall follow the procedure of establishing a three dimensional control network as described in the “Electronic Surveying and Data Management Guide”. The Consultant shall also use standardized descriptor codes for all data pickup, and the guidelines related to naming conventions and data handling, to ensure the integrity, validity and security of all data.

6.1.4.4 Elevations

Elevations during bench mark leveling are to be recorded to the nearest 0.001m (the third decimal figure is usually estimated).

6.1.4.5 Bridge Surveys

Bridge Surveys shall be conducted in accordance with the following:

- Appendix J – Example of a Bridge Report of “A Guide to Electronic Surveying and Data Management”.
- Section 1.3.3 “Site Survey Requirements” of Bridge Size Culverts – Design and Drafting Guidelines.

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6.1.5 DRAINAGE REVIEW (NON-BRIDGE SIZED CULVERTS)

Condition of all culverts shall be checked and inventoried. The sizing of the culverts should be checked to ensure it is appropriate. If any culverts are deteriorated, they shall be checked for excessive deformation to see if condition is suitable for installation of a plastic liner. If the culvert is deformed too much to install a liner, then the Consultant shall recommend an alternative to rehabilitate/replace existing culverts.

All drainage patterns along and adjacent to the roadway alignment shall be determined and surveyed (if necessary). The Geometric Assessment Report (when one is available) will be reviewed and additional verification of condition of various drainage structures will be completed as needed.

6.1.6 RIGHT-OF-WAY COORDINATION / PERMISSION TO ENTER & TEST

Prior to the commencement of roads, bridges, utility or soil preliminary surveys on private or crown land, written permission shall be obtained to survey and test from the property owners or renters, land management agency and/or utility company where required. Permission must be obtained for cutting down of any trees, brushing or clearing.

6.1.7 SOIL SURVEY

Please refer to Section 7 – Geotechnical Considerations.

6.1.8 UTILITY SURVEY

6.1.8.1 Utility Search

The Consultant shall search and locate all utilities during the Utility Survey stage. The Consultant shall contact all affected utility companies to gather detailed information and inform them of the proposed design and construction schedules.

This shall include, but is not limited to, the following:

- “Alberta One-Call” at 1-800-242-3447 (for buried utility locations). Consent from the utility companies shall be obtained prior to surveying over the utility easements. A minimum of two (2) full working days are required for the locates.

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NOTE: *Consultants should be aware that not all utility companies subscribe to “Alberta One-Call” and therefore additional searching may be required.*

- Energy Utilities Board (EUB). The EUB can provide high and low pressure location plans in township format (“Township Platf’s”) in the area of the project.
- Planning mosaic plans
- Land Titles (ownership, easements, caveats, etc.)
- Registered Pipeline Utility Plans are available at the Land Titles office. The plan numbers are usually shown on the roadway legal plans.
- Preliminary field survey.
- Alberta Transportation Pipeline Crossing Plan archives (microfiche and electronic; see Terry Gullekson @ 415-1026).
- Land Agents (when right-of-way is required).
- Landowner contact (i.e. private water lines). Contact with the landowners can best be done through the land agent during right-of-way and/or borrow negotiations. Obtaining “Permission to Enter and Test” approvals are also opportunities to inquire about utilities.
- Local Municipality

The Consultant shall complete a thorough search for all utilities. Searching all sources available as shown above as well as searching the site for signs of the utilities will demonstrate due diligence on the part of the Consultant.

The results of any initial contact made by the Department will be made available to the Consultant.

6.1.8.2 Notification Letter

The Consultant’s first contact with each utility company should be done at the preliminary survey stage, in writing, and indicating:

- the Consultant name and contact personnel.
- that the Consultant is representing the Department for this project.
- the project description, scope and type of work.
- the tentative design completion and tender advertising dates.

A set of preliminary mosaic plans or township plans should accompany the letter, with each of the applicable utilities highlighted. The letter should request the Utility Company to identify all of its utilities within the project limits and to provide the company’s contact personnel for field and design coordination.

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6.1.8.3 Pipelines

The Consultant shall make arrangements with the field representative of each affected company to locate and flag the alignment of each pipeline for the purpose of obtaining survey data.

The Consultant shall obtain exact locations of all buried pipelines in the highway right-of-way. This shall include the horizontal alignment and vertical depth of the utilities (by hand exposing or hydrovac) and then recording the elevations (generally at the proposed ditch locations and right-of-way boundaries). This requirement is normally used for major pipelines (high pressure), and may not be necessary for low pressure gas lines. Because adjustment to buried pipelines is required in most cases when the highway horizontal/vertical alignment and/or cross-section elements are improved, it may be more cost effective for Consultants to simply arrange for utility adjustments on low pressure gas lines based on highway design information rather than undertaking a full (hand-exposure) survey. This practice is acceptable provided that the low pressure gas line depth information is not needed at the design stage and provided that utility adjustments can be scheduled so that they do not adversely affect construction operations and safety. When a low pressure pipeline's adjustment/relocation is perceived to be expensive (e.g. pipeline parallel to the highway), a full exposure at the preliminary survey stage is generally required.

Where it has been determined by the Consultant that a full survey of a pipeline is required, the exposure of the pipeline shall be undertaken by the Pipeline Company or a Contractor hired by the Consultant for the Department. With the presence of field representatives of the Pipeline Company, the pipeline shall be hand exposed, and elevations taken both left and right in the proposed ditch areas and right-of-way boundaries. These four elevations are critical to the roadway design and assessment of any potential pipeline alterations. The company field representative shall be present during backfilling operations. Backfilling with acceptable materials and appropriate compaction shall be done as per the applicable utility agreement. The Consultant shall monitor the backfill operation to ensure that the disturbed area is left in a neat and tidy condition.

Due to the fragile nature of plastic pipelines, extra care and attention is required during their exposure.

The Consultant shall make allowance for the cost of hand exposing the pipeline or other means of locating utilities in their engineering proposal. The Consultant shall also be responsible for preparing utility crossing plans as required.

6.1.8.4 Power Lines

During the survey of power lines, the exact location of poles and/or structures shall be noted by chainage and offset from the proposed centerline (it is important at this stage to determine whether the poles and lines are within the existing right-of-way due to relocation cost implications). The number of wires, voltage and ownership shall be noted. Information concerning voltage shall be obtained from the local power company representative. Detailed plans are required for any location where power lines cross the highway or other roadways which will be constructed, improved or obliterated.

Detailed plans shall be prepared at all major intersections (for only the intersections that will be impacted by construction) that contain power poles, power lines, traffic signals and streetlighting.

In the case of buried power facilities, the power company representative will locate and flag their cable alignment and provide all relevant data. The exact location of the buried lines shall be noted by offset from the proposed centerline and crossings by the chainage.

6.1.8.5 Telephone Facilities

Owners of telephone lines will establish the location and flag the horizontal alignment of buried cables. The exact location of telephone cables, fibre optic lines, manholes, and pedestals shall be noted. The size and type of cables shall be recorded and any special features shall be noted.

Overhead telephone lines running parallel to the highway right-of-way are to be noted giving exact locations of poles, chainage and offset from proposed centerline, and number of wires. Lines crossing the right-of-way shall be noted by chainage. The exact location of poles and anchors located beyond right-of-way boundaries, which may be affected by construction, shall be noted.

6.1.8.6 Railway Crossings

At those locations where the proposed roadway alignment crosses a railway, or where it is proposed to widen an existing railway crossing, a special survey shall be completed to provide details of any railway crossing signals, control boxes or power sources present. The complete details of survey requirements and typical plans for railway crossings are shown in Section 1 (Instrument person's Railway Survey Guide) in the Department "Drafting Guidelines (CB4)". All railway coordination shall be in accordance with the Department's "Road / Railway Crossing Guidelines for At-Grade Crossings and Grade Separations" manual.

6.1.8.7 Other Cables

Other cables include television, telecommunication, pipeline company instrumentation, telegraph, railway operating cables, traffic counters, traffic light sensors, cathodic protection and high impact fibre optics. Television cables shall be referenced in detail in the survey field books. Overhead telegraph and railway operating cables shall be referenced with exact location of poles and number of wires.

Traffic counter locations shall be coordinated with the Department through Highway Asset Management (Peter Kilburn: (780) 415-1359). Highway Asset Management shall be advised of the type of work to be done and the tentative scheduling.

Traffic lights (including sensor loops), pedestrian crosswalk lights, and all warning beacons (amber and red) are owned by the Department and shall be coordinated through the Project Sponsor.

Cathodic protection cables are usually associated with a bridge-sized culverts and shall be coordinated through AT's Regional bridge section.

6.1.8.8 Illumination Assessment

The assessment of the need for illumination and/or determining the extent of illumination that is warranted (i.e. partial or full etc) will normally be done in advance of detailed design under an Engineering Assessment. Where this is the case, the Consultant will discuss the recommendations with the Project Sponsor to obtain additional direction as required. Refer to Section 5.2.4 for details.

6.1.8.9 Reporting Requirements

The Consultant shall provide mylar and digital copies of the completed drawings showing detailed information on utilities. For pipelines, "Pipeline Crossing Plans" must be completed. For all other utilities, the mosaic and/or intersection drawings can be used to show survey details. Utility survey information shall be recorded in the Survey Field Books and shall be submitted to the Department at the completion of the project. See Appendix "K".

6.1.9 REVIEW ACCESS MANAGEMENT

The Consultant shall review the access management for the project as outlined in the Access Management Guidelines in the Highway Geometric Design Guide. Proper access management on highways enhances safety for all road users.

6.1.10 SIGN INVENTORY

Existing signage on the project and signs adjacent to the project which may be affected by the proposed improvements shall be inventoried. The information collected shall include size, number, location and type of all signs (public and private). The condition of existing sign mounts, structures and sign faces shall be noted. Faces that are damaged or non-reflective shall be identified. Refer to Section 8.9 for information on Sign Design.

6.1.11 ENVIRONMENTAL REVIEW

The Consultant shall undertake an environmental overview of the project area. This requirement for the overview is normally included within the Terms of Reference. Biophysical resources to be examined generally included the following: fisheries, vegetation, noxious weeds, wildlife/waterfowl/other avian species, wetlands, surface/groundwater, historic resources, soils and species at risk.

The Consultant shall undertake a provincial interdepartmental referral as detailed in Section 4.2.2.

6.1.12 GEOMETRIC AND SAFETY ASSESSMENT, AND SURFACING STRATEGY

In the event that these activities have not been done in the planning or engineering assessment stages, these activities may be included as part of the preliminary engineering tasks at the discretion of the Project Sponsor. Refer to Section 5 – Engineering Assessment for details.

Where this work has been completed previously, the Consultant responsible for preliminary engineering is required to review the previously compiled data, engineering guidelines/warrants used and the recommendations made.

Repetition of the original analysis and assessment undertaken at the planning or engineering assessment stages is not required unless new information has become available or some design guidelines or technical needs have changed.

Consultants shall strive to achieve highly cost-effective designs while providing the standards which are appropriate for the highway according to Alberta Transportation’s “Highway Geometric Design Guide”. When pavement rehabilitation and/or geometric improvements are considered on existing paved roadways, designers shall use the information contained in Chapter G - 3R/4R Geometric Design Guidelines of the Department’s Design Guide. Where various options are being considered, for example for horizontal or vertical alignments, the guidelines contained

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in the Department's "Benefit-Cost Analysis (Summary, Guide and User Manual)" shall be followed to ensure that total societal cost and benefits are considered in a uniform way. Through the use of a consistent set of guidelines it will be possible to compare the merits of various alternatives on a particular project and to rank various projects according to economic indicators.

- Any changes proposed to the original reports will be documented and verified by the Project Sponsor and Technical Standards Branch
- Where a Geometric Assessment, Safety Assessment, Surfacing Strategy or other engineering assessment task must be completed at the Preliminary Engineering Stage, the reporting requirements are as shown in Section 5. In the event that an Engineering Assessment was completed in advance of Preliminary Engineering, the Consultant is required to document any changes that are proposed to the previously accepted recommendations. These changes should be supported by a suitably detailed rationale / analysis which may include a life-cycle economic analysis.

6.2 REPORTING REQUIREMENTS

- An ASCII geographic coordinate file (xyz values such as latitude, longitude, elevation) is required for roads and bridge site surveys to be submitted to the Project Sponsor upon completion of the preliminary survey. In cases where horizontal alignments are being improved or new alignments constructed and there is no planning study, an ASCII file of the alignment shall be submitted by the Consultant to the Project Sponsor as soon as the horizontal alignment has been finalized in the field. The purpose of this submission is to facilitate the Project Sponsor sending the information to the highway Geomatics Section of Program Management Branch to keep the inventory up to date. This digital ASCII file shall also include raw and processed data of survey, including geodetic datum, and any other survey specific information.
- All titles, survey data (hard copy and electronic data), copies of all pertinent correspondence and the original or all permits and approvals (e.g. permission from landowner to survey and/or enter land, and/or clear vegetation for survey purposes), shall be submitted to the Project Sponsor as part of the project documentation at the completion of the project.

A written report and an appropriate construction cost estimate is required for Geometric and Safety Assessment, and Surfacing Strategy of each construction project. Refer to Section 5 for details. The estimate for Surfacing Strategy should be a type "B" estimate. The estimate for Geometric/Safety improvements should be a "B"

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type if grading quantities have been calculated. If grading quantities have not been run, an estimate that is in the format of an “A” estimate but with more accuracy (due to knowledge of the geometric improvement requirements) is required.

Refer to Appendix “K” for more information on records management. The Consultant shall keep copies of all permits and approvals for their records. Any information that might affect the cost of the survey or incur liability to the Department shall be included.

Current References for Section 6:

Note that the references are in addition to those listed in Section 5.

A Guide to Electronic Surveying and Data Management, 1996, Alberta Transportation.

Benefit Cost Analysis (Summary Guide and User Manual), 1991, Alberta Transportation.

Drafting Guidelines (CB4), 1990, Alberta Transportation.

Excavation and Construction near Pipelines, January 1997, National Energy Board.

Highway Geometric Design Guide, 1999, Alberta Transportation.

Land Surveyor’s Manual of Standard Practice, April 1996, Alberta Land Surveyor Association.

Manual for Test Procedures, 1997, Alberta Transportation.

Pavement Design Manual, 1997, Alberta Transportation.

Pipeline Act; Pipeline Regulation (Alberta Regulation 122/87), 1995; 1999, Province of Alberta.

Public Highways Development Act, 1994, Province of Alberta.

Railway Act, 1996, Province of Alberta.

Road/Railway Crossing Guidelines, May 1997, Alberta Transportation.

Surveys Act; Survey Regulation (Alberta Regulation 94/2000), 1999, Province of Alberta.

Survey Manual, 1988, Alberta Transportation.

Traffic Control Standards Manual, 1995, Alberta Transportation.

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SECTION 7 - GEOTECHNICAL CONSIDERATIONS

7.1 GENERAL

Geotechnical investigations are required for highway, geotechnical and bridge projects. Specific requirements and guidelines for geotechnical investigations are being prepared at the time of this writing and will be presented in the Department's "Guidelines for Consulting Geotechnical Engineers" manual, due in March 2002.

This Section presents basic principles and requirements with which to guide the geotechnical consultant in the preparation of proposals and completion of their investigations. Irrespective of the requirements listed in this document, it is important that the Consultant clearly outlines in their proposal what assumptions were made in estimating the effort and resources necessary to complete the scope of work.

A project may consist of new road construction, grade widening, bridge and culvert design, and specific geotechnical projects such as landslide repair. Within any of these types of projects there may be numerous major areas of investigations, including roadway; borrow; bridge and culvert; soft ground or muskeg; landslide; erosion; and rock. General requirements for these types of investigations are outlined in the following sections. Requirements for culvert corrosion surveys are provided in this section. It should be noted that there are specific qualifications for personnel responsible for gathering field data and testing related to corrosion surveys. Requirements for topsoil survey related to topsoil conservation within the highway right-of-way, and for pre and post borrow assessments are provided in Section 4.

This section provides minimum requirements for testhole spacing. Sound engineering and application of 'common sense' principles should govern the project requirements for testhole spacing and locating. Minimum drilling requirements through problematic areas should be supplemented as required to provide a reasoned basis on which to proceed with the design, using a balance of risk acceptance and avoidance in harmony with project costs and objectives. For the purposes of this Section, 'testhole' and 'borehole' are interchangeable terms. Minimum requirements for field investigations, laboratory tests and reports are summarized in each subsection.

The Consultant's Geotechnical Engineer assigned to the project shall make at least one site visit, preferably prior to start up of the field investigation. This trip will help the engineer to familiarize himself with the site conditions and aid in the positioning of testholes. Several site visits may be required for complex sites such as major landslide or bridge projects.

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TABLE A provides a summary of field, laboratory and reporting requirements for each type of project listed below.

TABLE A - INVESTIGATION AND REPORT CONTENT REQUIREMENTS							
Type of Investigation		Office review	Minimum Field Investigation			Minimum Laboratory Testing	Reporting Requirements
			Location	Depth	Instrumentation		
Roadway (Section 7.2)	New construction	1, 2, 6	7, 8	21, 22, 23, 25	28,30	31, 33, 34	37-43
	Grade widening	1, 2, 3, 4, 5, 6	7, 9	21, 22, 23	28, 30	32, 33, 34	
Borrow (Section 7.3)		1, 2, 6	7, 10	21, 23	29	32, 33	
Bridges (Section 7.4)	Abutments	1, 2, 3, 4, 5, 6	7, 11	23, 24, 25	28, 30	32, 33, 34, 35	
	Piers		7, 12	22, 24, 25	28, 30	32, 33, 34, 35	
	Culvert		7, 13	23, 24, 25	28, 30	32, 33, 34, 35	
	MSE/retaining walls		7, 14	23, 24, 25	28, 30	32, 33, 34, 35	
	Wingwalls		7, 15	23, 24	28, 30	32, 33, 34, 35	
	Approach fills		7, 16	22, 24	28, 30	31, 34	
Culvert – Corrosion Survey (Section 7.4)		3	17	26	26	36	
Soft ground/ muskeg (Section 7.5)		1, 2, 3, 6	7, 18	23, 27	28, 30	31, 33, 34	
Landslides (Section 7.6)		1, 2, 3, 4, 5, 6	7, 19	19, 23	28, 30	32, 33, 34	
Erosion (Section 7.7)		1, 2, 3, 5, 6	7, 19	19, 23		31, 33, 34	
Rock (Section 7.8)		1, 2, 3, 6	7, 20	21	28	31, 33	

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Legend:

Office Review

1. Surface geology, bedrock geology maps and reports
2. Airphoto review
3. Consultant and Department geotechnical, bridge and design reports and file records
4. Construction records
5. Maintenance records, local peoples perspective
6. Site visit by Project Engineer

Field Investigation

7. Testhole or testpit
8. Drill at 200 m maximum spacing, (for topsoil survey assessment requirements refer to Section 4). Offset testholes as appropriate to provide coverage across the full width of the proposed construction. As a suggested guideline alternate drilling of centerline holes with testholes advanced along the right and left ditch lines.
9. Drill at 300 m maximum spacing if it can be determined that previous soils information is available and relevant, otherwise use 200 m maximum spacing. For topsoil survey assessment requirements refer to Section 4. Offset testholes as appropriate to provide coverage across the full width of the proposed construction. Drill along shoulder of the road to assess the existing road structure, along the existing embankment slope to determine the presence of waste materials for benching requirements, and along existing ditch which will form the foundation for the new fill.
10. Minimum of two testholes per borrow, for pre and post borrow disturbance assessment requirements refer to Section 4.
11. Minimum of one testhole per abutment. Siting of abutment and pier testholes should be done in conjunction with bridge planning objectives and existing site constraints.
12. Minimum of one testhole per land based pier. Drilling at all river based piers is preferred, however the use of Geometric Penetrating Radar (GPR) tied into land based testholes, or approved technique to determine soil conditions at river based pier locations may be acceptable. Limitations of the technique used should be discussed in the report. Siting of abutment and pier testholes should be done in conjunction with bridge planning objectives and existing site constraints.
13. Minimum of one testhole per 25 m culvert length at new culvert sites. Use judgement at culvert replacement sites.
14. Minimum of two testholes along each wall base, otherwise at 50 m spacing along Mechanically Stabilized Earth (MSE) structure.
15. Wingwall drilling is left to the discretion of the Consultant. Consultant will be required to document reasons for not doing investigation.
16. Typically drill one testhole per approach fill, about 50 m from abutment seat.
17. See Section 7.4.
18. Where feasible use auger truck to probe, alternatively use muskeg probe or vane testing. Some testhole sampling of muskeg and underlying mineral soils is required. Probe

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- muskeg at 20 m spacing along alignment, alternate left and right offset probes at 20 m spacing.
19. The actual number of testholes required is typically site specific. The number, location and depth of testholes to be determined by Consultant after site visit. For proposal purposes the Consultant should use engineering judgement and provide documentation of reasoning. Instrumentation requirements are also to be determined by the Consultant on a site-specific basis.
 20. Probe to rock surface at 50 m intervals, core rock at 100 m intervals
 21. Drill a minimum 2 m below ditch level or below bottom of borrow
 22. Drill to a depth equal to the fill height, or minimum of 2 m below existing natural grade in fill sections, whichever is greater. The depth of drilling should be consistent with the data requirements for stability analysis, etc.
 23. Samples are to be taken of each major soil type encountered, and where moisture conditions show abrupt change. Block samples of muskeg may be required. Undisturbed (pushed thin wall tube) samples and/or cores to be retrieved for advanced laboratory testing as appropriate
 24. Drill a minimum 3 m below pile foundation depth or a minimum 3 m below footing depth. Core a minimum 3 m into competent bedrock where encountered.
 25. Standard Penetration Test (SPT), Cone Penetration Test (CPT), Dynamic Cone Penetration Test (DCPT), vane testing, pressuremeter, dilatometer and/or muskeg probe as appropriate
 26. Corrosion survey. For requirements see Section 7.4
 27. Probe to firm ground at least 1 m below bottom of organic layer where organic terrain is encountered. Where buried valleys infilled with loose or soft compressible materials are encountered probe to at least three times the embankment height or 10 m, whichever is greater.
 28. The Consultant may elect to install slotted standpipe piezometers and slope indicators at deep cut locations.
 29. Slotted standpipe piezometers should be installed in at least one testhole per borrow, and may be appropriate for installation at culvert and Mechanically Stabilized Earth excavations and along approach cuts into bridge or culvert sites.
 30. Recommendations for instrumentation during construction should be included in the report. Such instrumentation may include standpipe and pneumatic piezometers, horizontal and vertical slope indicators, settlement monitoring devices, pile dynamic analyzer (PDA), etc.

Laboratory Test Program

31. The frequency of testing shall be a minimum of one ‘suite’ of tests per borehole. A ‘suite’ of tests consists of a moisture content test, and as appropriate, an Atterberg limit test and/or a grain size analysis, and estimates of optimum moisture content and maximum dry density for each tested sample.
32. The frequency of testing shall be a minimum of two ‘suites’ of tests per borehole. A ‘suite’ of tests consists of a moisture content test, and as appropriate, an Atterberg limit test and/or a grain size analysis and estimates of optimum moisture content and maximum dry density for each tested sample.

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33. Moisture content profile shall be completed for each testhole, meaning that all samples will be tested for moisture content.
34. Advanced testing as determined by the Consultant. This may include direct shear tests, triaxial tests, unconfined compressive tests, permeability tests, consolidation tests, point load tests, slaking tests, pinhole dispersion tests or other tests as deemed appropriate and justified by the Consultant.
35. Soluble sulphate testing for determination of cement type for locations where concrete will come into contact with soil.
36. Corrosion survey: soil resistivity and pH testing, sulphide, sulphate and chloride testing.

Report Content

The project report shall be a complete and comprehensive document. The report format is left to the discretion of the Consultant. The report shall provide the following information and any additional information as indicated in the project terms of reference

37. Executive summary
38. Office information review
 - Surface geology, terrain and drainage description
 - Bedrock geology if appropriate
 - Airphoto review comments
 - Existing geotechnical reports and file review
 - Discussions with locals, maintenance personnel, etc.
39. Field investigation
 - Field observations: terrain description, ground cover, drainage pattern, scarps, cracks, distressed ground, seeps, heaves, pavement distress, weather at time of inspection, etc
 - Description of drilling program, including testhole locations and depths summary
 - Adverse conditions encountered during drilling, caving or sloughing, loss of drill fluid circulation, refusal conditions, etc.
 - Discussion of groundwater conditions encountered during drilling, immediately after drilling, and after stabilization
 - Generalized soil condition descriptions, with exceptions noted as appropriate
 - Description of field tests and results, SPT, CPT, etc.
 - Details of instrumentation and monitoring program
 - Field corrosion test results, as applicable
40. Laboratory testing
 - Table of results indicating sample data, soil description, Unified Soils Classification System (USCS) description as modified by Prairie Farm Rehabilitation Association (PFRA), and all test results
 - Description of advanced test results, indicating limitations of test and test conditions, type of sample
 - Chemical test results, soluble sulphates, etc.
41. Engineering Assessment
 - Discussion of type of analysis undertaken
 - Discussion of material parameters used

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- Presentation of analysis findings and limitations if any
 - Discussion of risk, including uncertainty, associated with findings
 - Discussion of various hazard mitigative options, pros and cons, cost - benefit
42. Recommendations
- Requirements for mitigation of geotechnical risk at the site including but not limited to:
 - Requirements for contract special provisions
 - Staged construction, rate of fill placement
 - Surcharge or overbuild
 - Cut and fill slope angles
 - Stabilization measures for natural slopes, embankment or cut slopes and cost estimates for it.
 - Site dewatering, soil moisture conditioning
 - Swelling soil and frost heave mitigation
 - Soft ground construction
 - Fill and foundation settlement estimates
 - Volume modification factors for various fill materials to be encountered
 - Erosion control requirements
 - Foundation options and design parameters, bearing and skin friction values, negative or downdrag consideration, cement type related to soluble sulphate concentrations
 - Consolidation design, wick drains, drainage designs
 - Lateral earth pressure
 - Other construction related issues – requirements for monitoring & instrumentation, PDA or test pile requirements
 - Other geotechnical related recommendations as appropriate
43. Appendix
- List of references
 - Testhole logs, including electronic copy
 - Muskeg probe logs
 - Instrumentation records and readings
 - Stratigraphic cross-section and plan drawings
 - Photographs, site sketches
 - Advanced test result sheets

7.2 ROADWAY

The selection of the most desirable gradeline and alignment for highway grading projects are normally conducted through shallow testhole drilling methods inside and immediately outside of the proposed roadway prism. The reporting requirements for grade widening investigations are considered to be the same as for new construction. However there may be room for a relaxation in the frequency of testhole and

SECTION 7 – GEOTECHNICAL CONSIDERATIONS

laboratory testing requirements for grade widening projects, depending on the availability and quality of existing soil information.

Requirement for the depth and distribution of testholes/test pits should be determined based on findings of the office review and site visit by the Project Engineer. It is expected that additional testholes, beyond those stated in Table A will be undertaken if adverse soil conditions are expected or encountered during the course of the field drilling. Consideration should be given to augment the roadway investigation at deep cuts and high fills with offset testholes in order to provide sufficient stratigraphic data for a stability analysis to be undertaken. The possible presence of ‘snake pits’, narrow pits excavated to dispose of wet or otherwise deleterious soils along the toe of existing embankments should be evaluated through the file review, airphoto assessment, field inspection and drilling program.

Soil samples shall be taken of each change in soil type within a testhole. The size of samples shall be sufficient to meet the laboratory testing requirements.

Requirements for topsoil survey are provided in Section 4.

7.3 BORROW

The selection of suitable borrow material can have a significant impact on the success of a project during construction and in the long-term. Consultants are directed to avoid the use of frost susceptible materials as a road building material unless it can be demonstrated that no economically viable alternative exists and the design is optimized to limit the influence of the silt. Most borrow investigations are completed using auger drilling techniques or test pits. Typically borrow reports form a subsection of a grading geotechnical report, however occasionally project requirements may dictate that a stand-alone report be prepared.

Requirement for the depth and distribution of testholes/test pits should be determined based on findings of the office review and site visit. It is expected that additional testholes, beyond those stated in Table A will be undertaken if adverse soil conditions are expected or encountered during the course of the field drilling. Long term monitoring of groundwater conditions is a requirement of borrow investigations. The consultant should be prepared to revisit the site several weeks or months after drilling to monitor groundwater levels.

Soil samples shall be taken of each change in soil type within a testhole. The size of samples shall be sufficient to meet laboratory testing requirements.

7.4 BRIDGE AND MAJOR CULVERTS

Foundation investigations for bridge and culvert structures require a high level of care and experience. It is recommended that senior personnel with relevant experience be assigned to these projects. A field visit by the Project Engineer is a prerequisite that must be completed prior to field drilling. Site conditions may be adverse at the proposed site, but favorable a short distance away. Although a bridge site may be feasible, the approach cuts into a particular valley may traverse unstable terrain, requiring costly mitigative work. The Project Engineer must have sufficient experience to identify such conditions and to bring field issues forward to the design team at an early stage.

Similar equipment and methods of sampling used for grading design are commonly used for investigating bridge approach fills and foundations. The use of rotary drilling or wireline coring may be required to retrieve intact rock samples. Insitu vane shear, pressuremeter, cone penetration, and dilatometer tests are also undertaken where results from these tests would allow better interpretation of ground conditions for design.

7.4.1 CORROSION SURVEY

Corrosion surveys may be required as stand-alone projects or as a component of a larger study. The following steps provide a recommended procedure for determination of the corrosive potential of the soil and water at a culvert site. Procedures for determination of time to first penetration for water-side and soil-side corrosion, and design of cathodic protection systems are not included in this section.

Procedures for field determination of pH and resistivity.

- a) Take the pH and resistivity values of the soil on the road sideslope on both sides of the road, and in the upstream and downstream banks.
- b) Take the pH and resistivity values of the water at the upstream and downstream ends.
- c) Check for the presence of sulphide, sulphates, and chlorides.

Sufficient testing to accurately establish the corrosive nature of the soil and water in which the culvert is to be located, must be carried out, the location and numbers of the readings (or samples) is to be at the discretion of the Consultant.

- d) If the existing structure is a metal culvert, take static potential readings between the soil and culvert at 3, 6, 9, and 12 o'clock positions at the upstream and downstream ends. Readings shall be taken using a copper - copper sulphate half cell or approved equivalent.

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The Consultant may be required to undertake all the above tasks (a to d), or partial tasks. The site-specific requirements will be as directed by the Project Sponsor with input from the Consultant.

7.4.1.1 Reporting Requirements

- Provide a summary of all pH, resistivity, sulphide, sulphate, and chloride values obtained, together with the average values used for calculation purposes.
- Provide brief details of the testing methods used to obtain the values, and the significance of the results.

7.4.1.2 Qualifications

A Corrosion Technologist with at least 3 years related experience is the minimum qualifications required for personnel responsible for gathering field data, testing, adjusting and servicing cathodic protection systems etc.

A Professional Engineer who has specialized in corrosion engineering is the minimum qualification required for personnel responsible for preparing reports, interpreting data, providing recommendations, and designing cathodic protection systems etc.

7.5 SOFT GROUND/MUSKEG

Muskeg investigations are usually undertaken as part of a grading project. Test pits using backhoes, track mounted auger drilling and probing using muskeg probes or other acceptable methods of investigating the depth and characteristics of soft soils and muskegs provide supplementary means of acquiring relevant subsurface information to assist in site evaluation and assessment.

On occasion the Consultant may consider block sampling peat deposits and subsequent laboratory strength or consolidation testing. Owing to the difficulty and cost of this procedure, the Consultant should be prepared to justify the expenditure. Insitu vane shear testing can also be used for strength estimation.

The Consultant should identify any specific construction techniques required to build on muskeg or soft ground. In addition the risk factors associated with construction and long term maintenance of the roadway over muskeg terrain should be identified. An engineering and cost/benefit analysis should justify recommendations for inclusion or removal of the muskeg or soft ground. Muskeg probe logs should be maintained and included in the report Appendix.

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7.6 LANDSLIDE

Landslide investigations are typically a stand-alone project, however these types of investigations may also be undertaken as part of a grading design. The scope of the investigation can range from a site visit to more elaborate, costly drilling and monitoring programs. The project scope for landslide projects can be complex and time-critical. Consultants who work on these types of projects must be experienced geotechnical or geological engineers. It is recommended that senior personnel with relevant experience be assigned to oversee these projects.

A detailed airphoto interpretation shall be included in all landslide projects, in addition to a thorough review of past site information and nearby sites located in similar geologic settings. A field visit by the Project Engineer is a prerequisite that must be completed prior to field drilling. Site observations should be well documented through photographs and plan view sketches annotated with field observations. The site may be actively failing such that several visits may be required for the Project Engineer to fully comprehend and appreciate the failure mode and scale of the project. A multi-staged investigation may be required, spanning several weeks or months, depending on the level of activity at the site and the consequences of failure of the slide. The landslide geotechnical assessment is to be completed in two phases, a preliminary assessment, and a detailed design phase.

At least two feasible mitigative options shall be presented in the form of a preliminary landslide assessment. The preliminary assessment should include documentation of the investigation completed to date, the various soil parameters used, and appropriate reference sources, relevant slope stability analysis results, and current instrumentation monitoring results. The preliminary reports should identify the risk factors at the landslide site, and the associated probability of occurrence and consequence of occurrence. Relative terms such as low, medium or high may be used provided that these subjective terms are well defined. Lack of site information is considered to be a risk factor and this should be identified in the preliminary report. Large true-scale (same scale on both axes) stratigraphic cross-sections shall be included with the preliminary assessment.

The Department will undertake a review of the preliminary options and direct the Consultant to continue to detailed design of one approved option. Additional investigative, monitoring and analysis requirements may be added after the Department reviews the preliminary assessment. Any changes to the original scope of work will be negotiated.

7.7 EROSION

Erosion and sediment control issues are considered geotechnical issues for all projects. The Department is developing two manuals to assist in the assessment and design of erosion control measures. One manual will address issues related to long-term or permanent erosion control. Primarily consultants will use this manual. The second manual will address issues related to short-term or construction related erosion and sediment control. This will be a field manual intended for use by contractors and consultant field personnel. It will provide guidance for contractors in the development of ECO Plans and erosion control installation techniques. Both manuals are scheduled for publication in August 2002.

The consultant should determine what types of erosion and sediment control measures are suited to each particular site. The most effective means of sediment control is erosion prevention, hence the design should be directed to prevention techniques, where these techniques can be shown to offer practical and economically competitive solutions. Innovative solutions are encouraged.

Typically there may be several alternative designs appropriate for a given erosion condition. The permanent erosion control requirements shall be designed using an engineering approach based on acceptable principles of open channel flow hydraulics and soil mechanics. At least two feasible options should be prepared identifying pros and cons of each option, relative costs and associated risk factors for each option. The designs shall be supported by documentation of any design assumptions, soil and hydraulic parameters used in the analysis, method of analysis, and philosophy for selection of a given erosion control method. Erosion plans and sediment control related to wetlands and sensitive water bodies may require special design treatment stipulated by other agencies. Referrals to the appropriate agencies (e.g. Alberta Environmental Protection) shall be done at an early stage of the design.

All designs for permanent erosion control measures shall be submitted to the Project Sponsor and the Director of Geotechnical Services, TSB for review at least 3 weeks in advance of final design. The submission shall include drawings, quantities, estimated costs and design data.

7.8 ROCK

For projects where bedrock or boulders are encountered, e.g., shale, sandstone, large gravel or rock boulders of size 0.5 cubic metres and greater, or a combination of these materials are encountered, a “rock investigation” shall be undertaken as part of the geotechnical investigation. This rock investigation is to be conducted through rock core drilling and/or test pitting. The percent recovery and Rock Quality Designation

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(RQD) of cored materials is to be reported. Strength tests are to be conducted to determine classification of rock in terms of the rock classification outlined in the “Canadian Foundation Engineering Manual”. Seismic or GPR techniques may be useful in determine the bedrock horizon and in estimating the shear velocity of the rock. Shear velocity can be correlated to rippability, as noted in various equipment supplier handbooks. At this time the Department recognizes the compressive strength and point load index tests to determine classification of rock materials for pay item purposes.

For grading project a rock investigation report is required as a separate document. This report shall contain a detailed description of the investigation, test results, photographs of cores, and test pits, logs of stratigraphy, and quantity and classification of rock materials. Rock materials can be classified for payment purposes as common excavation, rock, and common excavation plus ‘extra over’ rock depending on the assessment from field and laboratory investigation.

7.9 BACKFILLING OF TEST HOLES AND RESTORATION OF TEST PITS

Test pits are considered to be large excavations. Test pits that are not properly restored may cause premature road distress. Deep excavations along the highway sideslope or ditch may destabilize the embankment. For these reasons where test pits are to be advanced in an existing roadbed or along the embankment sideslope or along the ditch at the base of the highway embankment slope; a test pit plan containing the method of excavation and backfilling test pits is required for approval by the Project Sponsor.

Test holes are to be properly backfilled in accordance with the established practices of backfilling testholes. In areas with environmental sensitivity, holes may have to be backfilled with cement grout, or other approved materials, to avoid cross contamination of aquifer zones and migration of surface waters or run-off to lower aquifers. This is especially significant at bridge sites. Each site should be treated separately and the Consultant shall provide proposed methods for backfilling the testholes for approval by the Project Sponsor.

If testholes are left open for a period of time, for the purposes of monitoring groundwater or sloughing conditions, provisions shall be made to temporarily cover and restrict access to the testhole and for permanent backfilling after the monitoring period is complete. The pavement or gravel surface is to be restored to its original condition after backfilling. Testholes that are not properly backfilled can cause injury to humans and livestock that can be a cause for litigation against the Consultant.

7.10 INSTRUMENTATION INSTALLATION AND MONITORING

Whenever instrumentation is required to monitor ground and groundwater conditions, an instrumentation installation and monitoring report must be prepared and submitted. A copy of the reduced monitoring data (on diskette) and analysis report must also be submitted to the Project Sponsor. Specific requirements for reporting will be developed for inclusion in the Department's "Guidelines for Consulting Geotechnical Engineers" manual, due in March 2002.

Instrumentation shall be protected from environmental hazards such as wildlife, recreational vehicles, construction traffic, maintenance vehicles, vandalism, etc. All installations should be well marked with adjacent tall lathe or sturdy posts, and labeled with permanent markings to identify the installation number, consultant and drill date. Provisions should be made to provide protective housings for instrument cables. In developed areas where vandalism is a concern, the use of locked metal protectors is recommended, especially in highly visible and well trafficked areas. Excess materials from the field program should be removed from the site and disposed of at approved dumpsites. It is unacceptable to dispose of any excess materials on site.

7.11 LABORATORY TESTING

Methods of undertaking laboratory testing and reporting for geotechnical purposes are outlined in ASTM and AASHTO standards with modifications for special non-standard requirements.

For grading projects, the standard laboratory testing 'suite' shall include:

- i) Visual description and classification according to Unified Soils Classification System as modified by the PFRA (ASTM D2487-98).
- ii) Field moisture content (ATT-15, Part I or IV as appropriate, or ASTM D2216).
- iii) Atterberg limits (AASHTO Designation T89 or T90 or ASTM D4318 Method A).
- iv) Washed sieve analysis, including the 5000, 1250, 400, 160, and 80 metric sieves (AASHTO Designation T88).

The following information shall also be included in these tests and form part of the summary of test:

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- i) Estimates of Standard Proctor maximum dry density and optimum moisture content based on the Department's tables. (Refer to the Department's Transportation Laboratory Test Procedures).
- ii) Plasticity Index and Liquidity Index.

Field visual description and classification, and laboratory moisture content tests shall be conducted on all soils samples.

Additional testing may be required depending on the project requirements. Test methods for: triaxial; direct shear; consolidation; swell; dispersion; hydraulic conductivity; rock quality, durability and strength; and other advanced geotechnical testing shall follow applicable ASTM test methodologies.

7.12 GEOSYNTHETIC AND EROSION CONTROL MATERIALS

The need for geosynthetics and erosion control materials must be supported by an analysis and design. Specifications for geosynthetic materials shall reference material properties that are appropriate for the design use intended. The use of 'generic' or 'all-purpose' specifications is considered appropriate only when these specifications address the analysis and design requirements of the project. Where judgment is used in selecting materials, reasons must be provided to show the practical, as well as economic, benefits of such material usage.

7.13 BOREHOLE DATA REPORTING

Reporting of test hole logs shall be done through a geotechnical borehole database system, such as GCA gINT software (Geotechnical Computer Application), or an acceptable end product equivalent. A Department customized template for gINT is available (free of charge) on the gINT website (<http://www.gcagint.com/reports.htm>). An electronic copy of all borehole logs shall be submitted to the Project Sponsor.

7.14 PRESENTATION OF SOILS AND ROCK INFORMATION ON MOSAICS

Soil descriptions on the mosaics are to consist of the principal soil types. Where rock or rock type materials are encountered, only the field visual descriptions must be shown on the mosaic logs with the corresponding graphic symbol. The results of the

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identified rock test will normally be made available to bidders. The gINT utility program facilitates conversion of standard testhole logs to a format appropriate for presentation on mosaics. (Reference: Drafting Guidelines (CB 4)).

7.15 REPORTING REQUIREMENTS

Where applicable, geotechnical conceptual requirements for planning, design, construction and maintenance shall be submitted for discussion and evaluation at an early stage of the project life cycle. Content requirements for geotechnical reports are outlined in Table A and preceding subsection.

The methods for field work, laboratory work, preparation and submission of reports must be well defined and compatible with the overall design and synchronize with the project schedule. The geotechnical report must accompany the design when submitted for review. The grading or bridge design shall have the soils logs and the proposed erosion and sediment control schemes included. Refer to Section 7.7 for reporting requirements for permanent erosion control measures. Depending on the nature of the project, some of this information may be needed at the concept engineering stage, if acceptance of concepts is required.

The Consultant shall provide two copies of the report to the Project Sponsor, unless otherwise directed.

The final project report must include a section or sections on the geotechnical issues identified in the earlier design stages, and how these were treated during construction. As-Constructed drawings (in microstation .dgn format) must be provided and any variations of methods, etc., outlined. Comments, notes and recommendation provided to the Project Manager should be included in the construction completion report.

7.15.1 DIFFERING SITE CONDITIONS (DSC) CLAUSES

Subsurface conditions are a result of natural geologic processes modified over time by natural events or the actions of man. Geotechnical investigations are undertaken to provide subsurface information to the designer and contractor. However, unanticipated ground conditions can and do occur. Contractors will be paid based on the terms of their contract. This may involve changes in compensation where unforeseen conditions are encountered. Nothing can completely remove the risk of encountering a differing site condition. However the potential for costly disputes over what constitutes differing site conditions is greatly reduced through a well-defined geotechnical baseline. To this end full disclosure of the geotechnical investigation report will be available to contractors at the tender stage. The Consultant therefore is responsible for ultimately setting the geotechnical baseline through the accuracy and

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factual representations of their work and to the contract conditions and specifications developed through the recommendations contained in the report.

Geotechnical reports are composed of factual, interpreted and qualified information. It is preferable to include all geotechnical information in the contract documents, however a stand alone geotechnical report can be referenced in the contract documents and made available at a prescribed time and location for inspection by the bidders. Factual information includes testhole logs, field and lab test results and the like. Interpreted information represents the opinions of a qualified geotechnical engineer based on the factual information. This should describe the thought process that led to the design, specifications and special provisions included on the plans and in the contract documents. Qualified information is factual information where the source of the data was not under direct control of the geotechnical design staff. Historical construction records, previous geotechnical reports and the like are examples of qualified information.

There are two principle types of DSC claims. A Type I DSC refers to subsurface or latent physical conditions at the site, including surface conditions, that differ materially from those indicated in the contract. Type I DSC is usually related to the factual information presented in the contract. A Type II DSC refers to unknown physical conditions at the site of an unusual nature differing from those ordinarily encountered and generally recognized as to be inherent in work of the character provided for in the contract. Type II DSC is usually related to the interpreted information presented in the contract. Both types of DSC can be greatly reduced through the establishment of a well defined geotechnical baseline with which to compare the encountered site conditions and the predicted or interpreted site conditions. To this end the Consultant should be neither overly optimistic about site conditions nor overly pessimistic, but should rely on a rational and objective approach to interpretation of the site conditions.

Specific disclaimer clauses can be used as plan notes to define factual and interpreted information, particularly in the case of bridge and culvert projects. This is preferred to the inclusion of blanket or general disclaimer. An example of a specific clause might be: “The testhole logs for TH100 to TH110 are representative of the condition at the location where each boring was made but conditions may vary between testholes.” This note indicates that the Consultant has used proper drilling techniques to locate, drill and log the testholes shown on the plans and documents. Soil conditions encountered at the location of the testholes that differ materially from those stated on the logs form the basis of a Type I DSC. Soil conditions between boreholes that differ substantially from those noted at the testhole locations, or that could not have been reasonably interpreted from the drilling logs, or that are unknown in the region would form the basis of a Type II DSC.

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Current References for Section 7:

American Association for State Highway and Transportation Officials (AASHTO) – Provisional Standards and Volume II Test, 1995, AASHTO.

American Society for Testing Materials (ASTM) Specifications, 1996, ASTM.

Canadian Foundation Engineering Manual, 3rd Edition, Canadian Geotechnical Society.

Canadian System of Soil Classification, 1987, Agriculture Canada.

Drafting Guidelines (CB-4), July 1995, Alberta Transportation.

Erosion Control Reference Material, Updated Draft, May 2001, Alberta Transportation.

Guidelines for Consulting Geotechnical Engineers and Technologists Assignments, May 1998, Alberta Transportation.

Transportation Laboratory Test Procedures, 2000, Alberta Transportation.

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SECTION 8 - GEOMETRIC DESIGN

8.1 GENERAL

The Consultant shall use the Alberta Transportation Highway Geometric Design Guide for all geometric design. The Consultant is responsible for all highway design activities including but not limited to:

- Grading and geometric design including horizontal and vertical alignment grade lines, passing lanes, climbing lanes, intersection geometric layout, interchange and roadside turnouts.
- Establishment of cross-section elements, drainage design (including culverts, curb and gutter, storm sewers), fencing design, retaining walls, etc.
- Roadside Facilities (Refer to Chapter “F” of the “Highway Geometric Design Guide”)
- Access Management (Refer to Chapter “I” of the “Highway Geometric Design Guide”)
- Guardrail design
- Railway Crossings (At grade and grade separated)
- Utilities
- Seeding
- Signing
- Guide posts (Delineators)
- Pavement Markings
- Preparation of the Grading Design Package (see Section 8.1.1).
- Special Aboriginal Agreements (Special Provisions for contract etc) if required (see Section 1.4.5).
- Optimization of stream and grade separation bridge crossings including geometrics, grading, bridge planning and structural design considerations

A “Consultant Highway Grading/Surfacing Design Coordination Flow Diagram” is provided for guidance in Appendix “E”.

The Consultant shall prepare a detailed computer aided design package for contract tendering. The Consultant shall use an appropriate and proven roadway design software package for geometric design, earthwork and quantity calculations, cross sectioning and masshaul diagrams. All work shall be done in accordance with applicable guidelines, standards and specifications. Standard drawings shall be used wherever possible. For relatively simple projects, especially if the grading work will be tendered as a lump sum contract, a design produced manually (without the aid of computers) may be acceptable. Information submitted for tendering purposes must be in electronic format.

SECTION 8 – GEOMETRIC DESIGN

8.1.1 GRADING DESIGN PACKAGE

The Consultant shall prepare a grading design package which will provide all the necessary details for the grading component of the Tender Package (see Section 11.1). The grading design package includes the following detailed design work:

- Design Exceptions (documents, economic analysis etc.)
 - Grading Estimate Summary
NOTE: A grading estimate summary for each project is required for multiple project submission
 - Summary of Estimated Grading Quantities
 - Unit Price Analysis
 - Intersection Analysis
 - Bridge documentation (written instructions, sketch) with Estimate Sheet
 - Design Review (Minutes of Review Meetings)
 - Pavement Design Cross-section
 - Utility Crossing Agreements and Adjustment Estimate (including all applicable Approvals, license, permits)
 - Geotechnical requirements
 - Illumination requirements
 - Signing requirements
 - Drainage and culvert requirements
 - Notes to Consultant's Representative
 - Applicable Special Provisions, Specification Amendments and Supplemental Specifications
 - Lists of Standard Drawings and Special Drawings
 - One set of full size and one set of reduced (11"x17") *mosaic plan-profile drawings, plans for intersection geometric layout, utility plans, overhaul diagram and other special drawings (signed as required for tendering) in Microstation .dgn format.
 - Contract Location Map (Key Plan)
- * Air photo mosaics as stipulated in Appendix "D" are required in pdf format for the full size (22" x 34") drawings unless otherwise specified in the Terms of Reference. The 11 x 17 drawings (reduced sized mosaic plans) shall be submitted without the photo mosaic image.

8.2 ROADSIDE FACILITIES

The Consultant shall assess the need for roadside facilities such as roadside turnouts, vehicle inspection stations, historical turnouts etc. The work required may involve

upgrading of existing facilities or construction of new facilities. The Consultant should first review the Terms of Reference and any relevant design or planning documents (Geometric Assessments, files and reports) for direction on this subject. Planning Reports are available which identify the suggested spacing and approximate location of roadside turnouts on all divided highways and some undivided highways in the Province. Contact the Highway and Roadside Planning Section of Technical Standards Branch for more information. If there is no clear direction contained in these documents, the Consultant shall ask for direction from the Project Sponsor on the adequacy of existing facilities as well as the need and feasibility of constructing additional roadside facilities on the project and on adjacent segments of highway. The general guidelines regarding spacing of roadside facilities contained in Chapter F of the “Highway Geometric Design Guide” together with a review of on-site conditions may be used to gauge the need for new or improved roadside facilities. Any additional roadside facilities that are considered desirable or necessary should be brought to the attention of the Project Sponsor for concurrence before proceeding with right-of-way purchases, survey or detailed design.

8.3 INTERSECTION DESIGN

The Consultant shall prepare intersectional analysis using traffic volumes, turning movement diagrams and collision history which can be obtained from the Department. The Consultant shall also review with the Department Project Sponsor prior to finalizing the intersection design. Guidelines regarding intersection design can be found in the Chapter D of the “Highway Geometric Design Guide”.

8.4 RIGHT-OF-WAY AND BORROW

The Consultant shall assess the need for Right-of-Way or Borrow based on design information and basic Right-of-Way requirements. The Consultant shall, as required, prepare plans for Right-of-Way purchase, and Borrow Agreements to obtain final agreements between the Department and landowners. Refer to Section 3 for more detail.

8.5 ROADSIDE DESIGN (Clear Zone, Mitigation of Hazards, Barrier Protection, etc.)

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On new construction projects the Consultant shall evaluate the traffic volume, traffic speed, highway function, terrain type and typical hazards and develop an appropriate strategy for clear zone, mitigation of hazards and barrier protection for the project. The design of guardrail at the edge of the finished road surface shall be minimized through the use of flatter side slopes and berms to either eliminate or offset the guardrail. Recommended fill heights and side slopes shall be used to reduce the extent of guardrail installation. On existing highways, the Consultant shall carry out all necessary survey, inspection and evaluation of existing traffic barriers. Efforts shall be made to eliminate the need for traffic barriers wherever possible by reducing the severity of hazards, relocating fixed objects outside of the clear zone and sideslope improvement. When assessing the need for traffic barriers, all scenarios shall be examined to achieve the best possible engineering solution to minimize risks and cost to road users, the Department, etc. In some cases, the preferred solution may involve no protection being used. Where it has been decided that existing barrier shall be retained/replaced, the condition of the various components should be assessed for possible replacement. Wood components will generally need replacement when they have rotted, cracked or become weakened due to age or weathering.

Where necessary, guardrail installations shall be designed with locations shown on the roadway design plans. Guardrail will normally be of the “weak post non-blocked out W-beam” type but the Consultant may recommend other approved types where considered appropriate. For roadways that are part of a multi-laning project, the “strong post blocked out W-beam” type shall be considered as the normal guardrail type. Justification for alternative guardrail types shall be included in the design report for Departmental acceptance. Refer to the Department “Highway Geometric Design Guide” and “Traffic Control Standards Manual” for guidelines and warrants pertaining to guardrail design.

Consultants should be aware that the Department is currently reviewing its policy in regard to roadside design. This review includes Clear Zone guidelines, policies for upgrading existing systems, guidelines for selection of new barrier hardware, end treatments, etc. When new information becomes available it will be posted on the Design Bulletin website

http://www.trans.gov.ab.ca/Content/doctype233/production/design_bulletins.htm

(as of December 2001)

and eventually published in a new Department document (likely titled “Roadside Design Guide for Alberta”).

8.6 RAILWAY CROSSINGS

The Consultant shall produce design plans for each railway crossing that is created or modified as a result of the highway improvement project.

The design submission package for each crossing shall include, in addition to the crossing design plan, the required Environmental Screening Report, a road and railway traffic estimate and all other documentation required for an application for approval to carry out the proposed work. In some cases, commitments related to cost sharing and maintenance distribution will be involved. As the approval process may take up to 18 months to complete, Consultants shall complete this phase of the project as early as possible. Consultants doing this work shall make themselves familiar with Railway Crossing Cost-Sharing arrangements and historical agreements. Refer to the Department's "Road/Railway Crossing Guidelines" for more information.

8.6.1 AT-GRADE CROSSINGS

The Consultant shall refer to the engineering assessment that is normally completed prior to design. Refer to section 5.2.3 in conjunction with the Department's Road/Railway Crossing Guidelines for more details on the at-grade crossing agreement procedures and engineering and safety standards .

8.6.2 GRADE SEPARATED CROSSINGS

In addition to the review of the assessment and recommendation mentioned in Section 8.6.1 the Consultant shall undertake the following tasks:

- bridge assessment
- bridge planning and DD Drawings
- evaluation of repair options
- advisement of adjacent landowners with respect to safety issues
- EARP (Environmental Assessment Review Process) when applicable
- Completion of the structural design, construction drawings, contract documents and construction inspections in accordance with Section 10 (Bridge Planning, Design, and Inspection)

8.7 UTILITIES

8.7.1 GENERAL

"Utilities" shall mean all power, telecommunications, pipelines and other cables or lines facilitating a utility system.

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The Consultant shall locate all utilities and prepare plans showing the relocation or adjustments required and shall begin making arrangements to have the work performed in conjunction with construction or prior to construction if possible.

The Consultant shall determine the impact to all utilities (including anchoring) effected by the proposed work. This shall include utility protection, relocations, and soil stability (stability of the soil beneath existing pipelines and backslope cut stability should all be considered). These impacts shall be conveyed to and coordinated with the Utility Companies.

The Consultant shall determine, in conjunction with Utility Companies, the most economical and practical method of utility relocation and/or adjustment by investigating all possible options such as:

- i) revision of alignment
- ii) highway gradeline adjustment
- iii) concrete slab pipeline protection
- iv) installation of pipe casing
- v) lowering and replacing of pipeline with thick walled pipe
- vi) relocation of the pipeline, power and telecommunication lines
- vii) thermal protection (water pipelines)
- viii) providing sufficient earth cover (i.e. ditch blocks)
- ix) other recommendations

The Consultant shall search for utilities in proposed borrow locations and avoid locating such borrows where there is a big impact on buried pipelines, if possible.

In general, borrows shall be located to avoid an impact on buried utilities. Borrow pit haul roads may need to cross such buried lines. If this is the case, reference must be made for such a crossing in the contract special provisions and a crossing agreement must be obtained from the utility companies.

Projects involving utilities relocation or adjustment work require ‘As-Constructed’ drawings upon completion of the work. These drawings shall be prepared by the Consultant and submitted to the Department as part of the Final Details.

When a pipeline relocation or adjustment work is completed prior to the construction of the roadway or bridge, the Consultant shall prepare and provide an ‘As-Constructed’ pipeline crossing plan to the Contractor. This plan shall indicate the exact horizontal location of the pipeline in relation to the station and offset and the vertical elevation of the pipeline in relation to the roadway centerline pavement elevation.

When utilities adjustment/construction work is considered along the highway in the vicinity where the road construction will be undertaken at the same time, the Utility Company shall be advised to contact and liaise with the Department’s Consultant to

avoid potential problems with the road construction work. The Consultant shall obtain information such as detailed plans/drawings, traffic accommodation and construction schedule from the Utility Company and coordinate all the information with the highway Contractor.

The Consultant shall monitor Utility Companies' operations for compliance with the Department's latest version of the "Traffic Accommodation in Work Zones" manual.

The Consultant shall include Utility Companies contact names and emergency telephone numbers in the special provisions and forward the final drawing(s) to the respective Utility Companies.

8.7.2 COORDINATION

The Consultant shall coordinate with all Utility Companies at the following milestone dates of the design, tender and construction process:

- i) Detailed Design (mid-design stage): The Consultant shall provide updated mosaic plans and utility crossing plans with the existing utilities shown on them. For simpler projects, such as intersectional improvements, intersection plans with hand-sketched locations of the utilities will be sufficient. All plans at this stage should be marked "Preliminary". This shall be completed as early as possible, to provide the Utility Companies enough lead time for preparing adjustments to the design. It is recommended that the Consultant hold interim coordination meetings as required to discuss the on-going design with the Utility Companies. The Consultant should request the Utility Companies to commence their adjustment design and their preparation of estimated costs at this time.
- ii) Final Design: The Consultant shall submit design drawings, utility crossing plans and copies of the agreements for final design review to all affected Utility Companies. At this stage, the Consultant shall finalize the utility adjustment costs by requesting the final costs in writing from the Utility Companies. This shall be done a minimum of two (2) weeks prior to the Final Design Review Meeting. (See Appendix H for sample agreements and letters)
- iii) Final Design Review Meeting: The Consultant shall invite all Utility Companies to the Final Design Review Meeting. All design concerns and costs associated with the utilities shall be finalized at this stage.
- iv) Signing of Crossing Agreements: The Consultant shall get all agreements signed, with agreed costs, prior to tendering (one month in advance of tendering).

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- v) Tender Advertising: The Consultant shall inform all Utility Companies affected by the work about the tender advertising date and the tender opening date. This shall be done in writing.
- vi) Pre-Tender Meeting (Optional): If a pre-tender meeting is held, the Consultant may consider inviting the Utility Companies depending on the nature of the meeting and the level of impact the utilities are to the project.
- vii) Construction Schedule: Once the successful Contractor's schedule is provided to the Consultant he shall provide this schedule to all Utility Companies affected by the work. At this stage, a letter should be sent by the Consultant to the Contractor with a copy to the Utility company indicating that the Contractor is responsible for all utility coordination henceforth.
- viii) Pre-Construction Meeting: The Consultant shall invite all Utility Companies to a Utility Pre-Construction Meeting to coordinate the Contractor's interaction with the Utility Companies. The meeting with the Utility Companies and the Contractor may be held separately from the main Pre-Construction meeting.

8.7.3 UTILITY EASEMENTS AND CLEARING

The Consultant shall review the need for Utility easements along the project with the Utility Companies and provide this information to the Department's Land Agent (internal or external). The Land Agent will not negotiate for any easements, but may advise the land owners so the land owners clearly understand the impact to their land. Utility Company representatives will contact the land owner separately to obtain their easements.

The Consultant shall coordinate with the Utility Companies to determine the need and timing for clearing within the right-of-way and easements (existing and/or proposed). The Consultant shall consider the following options:

- Clearing to be completed as per Alberta Transportation's construction contract (standard practice). If timing is a concern, the Consultant may, if permitted by the Project Sponsor, specify an earlier completion date for the clearing in the Tender document.
- The Utility Company provides their own clearing for their utility relocation.
- A separate Alberta Transportation contract is prepared for clearing the right-of-way and easements.
- The Utility Company clears the highway right-of-way and their easements under their own contract. The Utility Company's contract must contain the same level of

clearing and timber salvage specifications as in an Alberta Transportation contract.

When applicable, the Consultant shall discuss these options with the Project Sponsor, and the Project Sponsor shall make the decision on which option is to be used.

The cost for the highway right-of-way clearing typically will be paid by the Department. When an existing utility easement is present and is already cleared, the Department will pay for the clearing of any proposed easement obtained by the Utility Company provided that it is a registered easement. When there is no existing easement or the existing easement is not cleared, the Department will not pay for clearing in any old or new easements.

8.7.4 CROSSING ADJUSTMENT AGREEMENTS

The Consultant shall first check with the Project Sponsor to see if any historical agreements and permits for utility work exist and to review the approval condition(s) of a particular utility installation. Older “Utility Construction” agreements (which may only be useful for new alignments) are stored in the Semi-Active Records Centre at the Twin Atria Building. Utility crossing agreements stored in the Semi-Active Records Centre may be accessed by reference to the legal land description at the crossing location. Request for Corporate Information forms and Historical Agreements/Permits District Contact Persons list may be obtained from the Senior Utilities Engineer, Technical Standards Branch.

The following are the current general practices which apply to cost responsibility for utility relocations/adjustments:

- Power lines - Those within the right-of-way are adjusted/relocated at the Utility Company’s cost. Distribution lines (less than 69kv) anywhere outside the right-of-way are relocated at the Department’s cost. Transmission lines (greater than 69 kv) within 30 metres of the right-of-way (particularly paralleling lines) may have a condition requiring the Department’s approval but the Utility Company is responsible for the relocation costs. The Department has a model agreement with ATCO Electric and Utilicorp Networks Canada for the placement of their lines within primary highway rights-of-way. Details of the agreement are included in the Alberta Transportation Utility Guidance Manual.
- Existing lighting located along three digit provincial highways – While working with three digit provincial highways which were previously under the Municipalities’ jurisdiction, Consultants should check with Municipalities for copies of permits and agreements. The Department will honour these agreements signed by the Municipalities until they expire.

SECTION 8 – GEOMETRIC DESIGN

- Telecommunication lines - Those within the right-of-way are generally adjusted/relocated at Utilities Companies' cost. Those outside the right-of-way are adjusted/relocated at the Department's expense. The Department is negotiating a model agreement with Telus dealing with their lines within primary highway right-of-way. There are and will likely be more agreements with other telecommunication companies such as Shaw Cable, Total Telecom, etc.
- Pipelines governed by the Pipeline Act (Major oil and gas lines) - For these types of crossings, generally the Department pays for adjustments and relocations unless there was a specific condition in the Department's approval making the Utilities Company responsible for future adjustments/relocations or the utilities Company's installation does not meet the specified conditions as outlined in the permits issued by the Department.
- Lines which run to parallel highways are normally positioned (by practice) at a minimum offset of 30 metres outside of the right-of-way boundary (any line offset at 30 metres or greater from the right-of-way boundary does not require the Department's approval). Where there are cases of these pipelines paralleling a highway within 30 metres outside the right-of-way, the Department's approval may have included a condition that the company pays for future adjustments or relocations. It is very rare that these lines will be found paralleling the highway within the right-of-way. If this is the case, it is very likely that an agreement or condition of approval exists, making the Utility Company responsible for any adjustments/relocations.
- Pipelines governed by the Public Highways Development Act (water, sewer, low-pressure gas) - Any of these lines located within 30 metres outside the highway right-of-way require the Department's approval. Generally, lines within the highway right-of-way paralleling the roadway are adjusted or relocated at the cost of the Utility Company. There may be permit/approval condition(s) applied to a paralleling line within 30 metres outside the right-of-way requiring the owner to adjust/relocate the line at his own cost. For many gas cooperatives, if not all, there are agreements in place which deal with relocation/adjustment costs.

If, prior to the construction of a new pipeline crossing (subsequent to the Operator entering into a model agreement with the Department), the Department specifies that the crossing be at a particular depth and/or location, and the Company has met these specifications, any later relocation of the crossing which is required by the Department will be at the sole cost of the Department. If the Utility Company chooses not to meet these specifications and elects to construct the new pipeline crossing, to current minimum standards, as set out in the Energy Resources Conservation Board Act and subsequent relocation is required by the Department, the relocation will be at the sole cost of the Utility Company.

In the case where the road right-of-way within the crossing area, is widened as requested by the Department, beyond the width defined in the permit as required for

the improvement of the road, the cost to adjust or lower, or relocate that portion of the pipeline within the added right-of-way will be borne by the Department.

Prior to submitting for Department's approval, the Consultant shall finalize and sign utility plans/drawings based on negotiations and crossing agreements with the Utility Companies.

The Consultant shall use standard Department agreements. Examples of typical agreements to be used for adjustments to telecommunications, power, pipeline utilities and railway crossing material cost are shown in Appendix "H" or the Department Utility Guidance Manual. Any cost implications are to be attached to the agreements. The Project Sponsor will be a signatory in all crossing agreements and cost apportionment.

All agreements shall be in place prior to tendering (one month in advance of tendering).

8.7.5 UTILITY AGREEMENTS

The Utility Agreement shall also include the following:

- The Utility Company must implement traffic accommodation procedures in accordance with the Department's typical standards outlined in the current version of "Traffic Accommodation in Work Zones" manual when working inside the highway right-of-way.
- The Consultant's role and responsibility to deal with utility construction is outlined in the Department's latest version of "Traffic Accommodation in Work Zones" manual.

8.7.6 UTILITY SPECIAL PROVISIONS

The Consultant shall prepare utility special provisions based on the above negotiations and agreements. Refer to Section 11.1.4 for more information on accessing an up-to-date version of the standard Special Provisions.

8.8 SEEDING

The Consultant shall prepare seeding and fertilizer requirements for disturbed areas. Refer to Section 11.1.4 for more information on accessing an up-to-date version of the standard Special Provisions.

8.9 SIGNING

The Consultant is responsible for preparing an inventory of existing permanent signs (which will identify signs, posts, etc. that may be reused) and produce a plan of all permanent signs required for the project. The tender documents for a project will need to show the number of “remove and re-install” as well as the number of “supply and install” signs. Standard signing plans may be used in some cases, for example for standard intersection treatments or for climbing/passing lanes (see the “Traffic Control Standards Manual”). Customized plans shall be prepared whenever the standard plans do not show the necessary detail. The plan shall include any signing off the site which is required as a consequence of the project. Approval of the Project Sponsor is required for customized signing plans.

If identified by the Project Sponsor in the Terms of Reference, the above plans may be used for bidding purposes on a lump sum basis (rather than the conventional payment per sign method).

A detailed schedule of all signing requirements must be prepared and made available at the tendering stage if a lump sum bid is used. A Special Provision may be used to modify the payment method.

8.9.1 PRIVATELY OWNED SIGNS

The Consultant shall be aware that the Department has several sign programs available to private facilities and businesses along highways. The Department leases or assigns space in the highway right-of-way for placement of these signs, and the private sign owners are responsible for the installation and maintenance of their own signs. Any adjustment to these private signs, such as removal and reinstallation during construction, are the private sign owners’ responsibility. Examples of privately owned signs include Community Business Signs, Sponsorship Signs (i.e., Red Light Means Stop, Call Boxes), Brown Facility Signs, etc.

The Consultant shall prepare a list of existing private signs requiring adjustment along the highway, including the sign owners’ contact information. The Consultant shall obtain the ownership information and existing lease agreements for the privately owned signs from the appropriate Department District Offices. The Consultant shall include Special Provisions in the tender document outlining the Contractor’s responsibility for arranging sign adjustments with sign owners prior to construction activities. These privately owned signs are excluded from the bid item schedule, as the Department will not compensate the Contractor for removal and installation of private signs.

8.10 GUIDEPOSTS (DELINEATORS)

Delineators shall be designed as per the design guidelines contained in Chapter 2 of the Barrier Section of the Department “Traffic Control Standards Manual” and “Traffic Accommodation in Work Zones Manual”. This guideline provides a warrant, recommended spacing and installation details for delineators.

8.11 PAVEMENT MARKINGS (COMBINED GRADING/ SURFACING PROJECTS AND SURFACING PROJECTS)

The pavement marking requirements for all intersections, interchanges, passing lanes, rest areas, vehicle inspection stations, auxiliary lanes and similar highway features shall be shown. This may be done through the use of standard plans where applicable (see the “Alberta Highway Pavement Marking Guide”) or through the use of customized plans for the project.

The Consultant shall identify pavement markings (including pavement messages) required for school zones, railway crossings, R.C.M.P. aircraft patrol zones, stop lines, etc., where these are required on the project.

If identified by the Project Sponsor in the project Terms of Reference, the above plans may be used for tendering purposes on a lump sum basis (rather than the conventional payment by quantity method).

8.11.1 LANE WIDTHS (PAINTING)

Because lane width standards have changed over the years, there is a need to follow a consistent practice to implement the current standards. The current practice for painting lane widths on rural and urban roadways is as follows:

1. Normal maintenance involves repainting lines in the same location as the existing lines. This avoids the problem of having two lines visible.
2. When projects come up for construction or pavement rehabilitation, lane widths are painted as per the current geometric design standards. This includes all types of construction contracts (e.g. new construction, grade widening, overlay, seal-coat, etc.). After the roadway has been built to the current metric standards, periodic repainting will preserve the standard lane width.

8.12 RUMBLE STRIPS

Unless specifically identified in the terms of Reference, rumble strips will not be required in regular highway projects. Under special circumstances (perhaps due to a desire to have rumble strips installed more quickly) the Project Sponsor may request that rumble strips be included in a regular construction contract.

Guidelines for placement (utilization) of rumble strips on shoulders, centrelines and at stop conditions are available from Technical Standards Branch. These guidelines/practices have been developed based on experience and take into consideration accommodation of cyclists, mitigation of noise near residences, collision experience at intersections and on curves and other factors. These guidelines/practices will be incorporated into design manuals in due course.

8.13 HIGHWAY ILLUMINATION (LIGHTING)

The Consultant shall prepare plans identifying all existing highway illumination systems which will require modification, expansion or replacement on the project, and recommend new lighting installations which may be required as a result of the highway construction or improvement.

Consultants shall be aware that:

- Lighting design shall be the Consultant's responsibility (the electrical utility company may provide design input and advice) and shall be included in the Tender Package.
- Each lighting installation is the subject of an agreement with the Department.
- Where additions or alterations to existing lighting arrangements are proposed, the Consultant shall research the ownership and operating conditions pertaining to the existing installation.
- Because of time requirements, it is necessary that lighting needs be identified early in the project design to allow for discussion/concurrence with the Project Sponsor, detailed design, review and co-ordination with electrical utility companies.
- The Consultant shall prepare a draft agreement to be signed by the electrical utility company and the Department, detailing the capital and operating costs and any proposed cost sharing arrangement.

Warrants and Operating Guidelines for Highway Lighting should be referenced from the “Guide for Design of Roadway Lighting”.

8.14 TRAFFIC CONTROL SIGNALS

The Consultant shall produce a plan for each traffic control signal and/or pedestrian crosswalk signal that may be required on the project. The plan shall include all details of the signals, signs, markings, roadway geometrics and ancillary features.

The warrant for traffic control signals will normally be 80% of the traffic and safety warrant contained in the “Manual of Uniform Traffic Control Devices for Canada”. The warrant for pedestrian crosswalk signals is contained in “Pedestrian Crossing Control”, a supplement in draft stage for the “Manual of Uniform Traffic Control Devices for Canada”. As signal installations are normally subject to internal Departmental review and approval, the Consultant shall identify potential signal requirements prior to undertaking the actual design.

8.15 INDEPENDENT DESIGN CHECK

The Consultant shall carry out a complete check of the design and drawings (stamped and signed) using an engineer other than the individual responsible for the design.

8.16 FINAL DESIGN REVIEW

If required, a final design review meeting will be organized and attended by the Consultant, Project Sponsor and representatives of other concerned branches of the Department. The Consultant will select the time and place for the meeting (after consultation with the Project Sponsor), will establish an agenda and shall act as chairperson at the meeting.

Assuming that all significant design decisions have been made at this point, this meeting should concentrate on reviewing the final design, confirming that all necessary changes have been made, finalizing and packaging the design (including the drawings) for submission. Specification shells, Special Provision requirements, etc., should be checked and tender schedule and design submission date confirmed.

8.17 COST SUMMARY

Where the “C” estimate for the project exceeds the approved funding (‘B’ Estimate) by more than 20%, the Consultant shall provide written reasons for the increase in estimated cost.

8.18 REPORTING REQUIREMENTS

The Consultant shall deliver the final roadway design to the Project Sponsor for review no later than two weeks before the date scheduled for delivery of the final tender package. Refer to Section 11.1.7 for information on timing for submission of the finalized Contract Tender Package.

The **final roadway design package** shall include both electronic and hard copy of the tender documents, and an electronic copy and set of blueprints of the plans. Documents and plans required for record purposes are listed under Roadway Design in Appendix “K”. The Roadway Tender Package requirements are included in Section 11.1.

Current References for Section 8:

A Guide to Electronic Surveying and Data Management, 1996, Alberta Transportation.

A Policy on Geometric Design of Highways and Streets, 2001, AASHTO.

Alberta Highway Pavement Marking Guide, 1999, Albert Transportation.

Alberta Transportation Utility Guidance Manual, 2001, Alberta Transportation.

Erosion Control Reference Material, 2001, Alberta Transportation.

Guide for Design of Roadway Lighting, 1983, TAC.

Highway Geometric Design Guide, 1999, Alberta Transportation.

Highway Signing Policy Manual, 1986, Alberta Transportation.

Highway Standard Plates CB-6 Standards, 1999, Alberta Transportation.

Geometric Design Guide for Canadian Roads Part 1 & 2, 1999, TAC.

Manual of Uniform Traffic Control Devices for Canada, 1996, TAC.

Pedestrian Crossing Control, 1998, TAC.

Pipeline Act, 1995, Province of Alberta.

Preliminary Survey and Design Requirements for Highway Projects Undertaken by Consulting Engineers, 1995, Alberta Transportation.

Public Highways Development Act, 1994 Province of Alberta.

Road/Railway Crossing Guidelines, 1997, Alberta Transportation.

Roadside Design Guide, January 1996, AASHTO.

Schedule of Signs, February 1995, Alberta Transportation.

Signing Pattern Manual, 1986, Alberta Transportation.

Survey Manual, 1988, Alberta Transportation.

Traffic Accommodation in Work Zones, 2001, Alberta Transportation.

Traffic Control Standards Manual, 1995, Alberta Transportation.

Urban Supplement to the Geometric Design Guide for Canadian Roads, April 1995, TAC.

SECTION 8 – GEOMETRIC DESIGN

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SECTION 9 - SURFACING DESIGN

9.1 GENERAL

Surfacing Design includes:

- First course gravel for grading projects
- Base and Paving
- Final Paving
- Pavement Rehabilitation
- Seal Coats

9.2 SURFACING DESIGN PACKAGE

The Consultant shall complete a surfacing design package (using the Department's standard format as per Appendix F) that will include but is not limited to:

- basic surfacing strategy
- detailed structural design
- aggregate requirements
- binder material
- Special Provisions if needed
- supplemental specifications and specification amendments if required
- bid items description
- quantity and cost estimates

NOTE: *A surfacing estimate for each project (combined projects) and a surfacing estimate summary are essential requirements for every job submitted to Program Management Branch (Tel No. 415-1081).*

- plans
- pavement markings(see Section 8.11).

The Surfacing Design and Tender Package (refer to Section 11.1) shall consist of all information needed for tendering purposes. Detailed surfacing design information does not have to be submitted with the Surfacing Design and Tender Package; however, it shall be retained as outlined in Appendix "K" (Records Management by Consultants).

SECTION 9 – SURFACING DESIGN

9.2.1 SURFACING STRATEGY AND BASIC STRUCTURAL DESIGN

The Consultant shall adhere to the surfacing strategy and basic structural design, as prepared by the Regional Consultant (refer to Section 5.3) and included as part of the Information Package in the Terms of Reference for the project. The Consultant shall perform a site inspection of the roadway at the time detailed design is being undertaken to pinpoint and finalize the project limits. The roadway condition shall be assessed to identify and rationalize the need for preliminary leveling, repair of failed areas, additional ACP quantities for crossfall/superelevation corrections and special treatment of cracks.

If for any reason, it is deemed necessary to revisit the surfacing strategy and basic structural design, the work shall be referred to the Project Sponsor and the Surfacing Standards Specialist at Technical Standards Branch.

9.2.1.1 Laboratory Testing

The Consultant shall carry out all necessary laboratory testing and evaluation which may have been identified in the Terms of Reference or which were deemed necessary at the detailed engineering stage. The results of this testing and evaluation shall be documented and appended to the design package.

9.2.2 GRAVEL SURFACING AND SEAL COAT

Department guidelines for gravel surfacing design and seal coat type are included in Appendix “F”.

9.2.3 GEOMETRICS AND CLEARANCES

Where the project is primarily a “surfacing” job, the Consultant shall confirm the appropriate roadway geometrics including minimum vertical clearances allowed under overpass structures and shall include in the design package all works such as interchanges (including ramps and loops), intersection treatments, sideslope improvements, superelevation corrections, horizontal and vertical alignment improvements, railway crossings, guardrail design, culverts, treatment on bridge decks and on approaches to bridge decks. Where the project involves a significant grading component, the review and analysis of geometric elements is normally undertaken as part of the Geometric Design. Liaison with the Project Sponsor is essential.

9.2.4 AGGREGATE REQUIREMENTS

The Consultant shall quantify all aggregate requirements and coordinate aggregate supply conditions for the project.

The volume of aggregate required needs only to be an estimate based on the major components of the project. Co-ordination of the aggregate supply conditions shall be in accordance with Section 9.3 - “Supply of Aggregate”.

9.2.5 BINDER MATERIAL

Where applicable, the Consultant shall select, specify and quantify all surfacing binder materials. Binder material for asphalt concrete pavement shall be in accordance with the asphalt concrete mix type and characteristics currently in use by the Department.

9.2.6 SPECIAL PROVISIONS

The Consultant shall assemble all necessary standard Special Provisions and develop such project specific Special Provisions as may be required. Refer to Section 11.1.4 for details on accessing up-to-date versions of the standard Special Provisions.

9.2.7 SUPPLEMENTAL SPECIFICATIONS & SPECIFICATION AMENDMENTS

The Consultant shall identify all supplemental specifications and specification amendments applicable to the project.

9.2.8 BID ITEMS QUANTITY AND COST ESTIMATES

The Consultant shall provide detailed bid item descriptions, bid item codes, quantity and cost estimates and summaries for the required surfacing work in the Department standard format. Examples of this format are included in Appendix “F”.

If multiple projects are to be included in the contract works, a materials distribution chart must be included in the tender document. A sample of this chart is included in Appendix “F”.

SECTION 9 – SURFACING DESIGN

Where applicable, the Consultant shall also include bid item descriptions and cost estimates for roadway and intersection line painting, “grooved” or “milled” rumble strips on shoulders or at stop locations, side sloping, guardrail (removals and installations) signing, plus any sidewalk, raised median, or curb and gutter requirements.

9.2.9 PLANS

The Consultant shall provide a key plan showing the project location and limits, plus the location of all major intersections, bridge structures, vehicle turnouts and climbing lanes included within the project limits or scope of works. Detailed customized plans of intersections need only be provided where new construction or changes in layout are involved. An example of the necessary key plan is included in Appendix “F”.

In addition, the Consultant shall produce all necessary drawings to provide clear delineation of the work required.

The Consultant shall attach aggregate plans as part of the design tender package.

9.2.10 REPORTING REQUIREMENTS

The Consultant shall deliver the complete Surfacing Design Package to the Project Sponsor for review no later than two weeks before the date scheduled for delivery of the final tender package. Refer to Section 11.1.7 for information on timing and details for submission of the finalized tender package.

9.3 SUPPLY OF AGGREGATE

9.3.1 AGGREGATE SOURCES

9.3.1.1 General

In general, the Contractor is responsible for the supply of aggregate materials. To assure an economical supply of aggregates and to obtain competitive bids, a Department controlled aggregate source will normally be offered as an option. The Department’s policy regarding aggregate management is identified in Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration.

9.3.1.2 Aggregate Data Summary Request

The Consultant shall request an aggregate source from the Regional Aggregate Coordinator as soon as a reasonable estimate of the gravel component is available. An electronic copy of the Aggregate Data Request Summary form shall be obtained from the Regional Aggregate Coordinator. The “Aggregate Data Summary Request” shall be used to identify the project, project limits, type of work, type of material, and the approximate quantity of aggregate that is required. The request shall be submitted a minimum of six weeks prior to the tender submission date (unless the Department advances the project on short notice). The Department will issue to the Consultant the finalized “Aggregate Data Summary Request” for all projects, including those with no optional aggregate source. The Consultant shall use this information in the design. The consultant is responsible to review the Special Provisions, Plans and the Aggregate Summary Request, and convert the data for inclusion into the tender documents.

An amended summary shall be submitted at any time that the aggregate quantity increases because this may necessitate a change to the pit-operating plan or require a change to a different aggregate source.

9.3.1.3 Payment for Aggregate

Payment for the supply of aggregate will be made to the Contractor through a separate bid item. This value will be predetermined by the Department as stated in the form “Aggregate Data Summary Request” in Appendix “G” and included in the tender documents when the specification amendments indicate that the contractor may use a Department controlled source. No aggregate value will be assigned if the specification amendment indicates that the contractor may NOT use an aggregate source controlled by the Department. Eligibility for payment is identified in the Standard Specifications for Highway Construction manual.

9.3.1.4 Pit Reclamation

Progressive reclamation of pits in conjunction with construction or crushing contracts is a normal practice followed by the Department. It is reasonable and desirable to follow this practice to minimize double handling of overburden and reduce the Department’s outstanding liability for reclamation.

The Consultant shall assess the need for pit reclamation on each project, as well as whether a Department controlled source is offered as an option, and recommend, to the Regional Aggregates co-ordinator, changes to the Special Provisions of the contract tender accordingly.

SECTION 9 – SURFACING DESIGN

9.3.1.5 Aggregate Source Controlled by the Department

Where a Department source is made available for a project, the Department will provide the relevant pit information including Aggregate Source Summary Request, Aggregate Testing Plan, Approvals, operating plan and conditions, Summary of Aggregate Sieve Analysis, and the aggregate value (which is to be used for the “Supply of Aggregate” bid item). The Consultant shall use this information to form the Special Provisions. If the plans or approvals require updating or are not available, the Consultant is responsible for obtaining them and providing them to the Department. This includes surveying the source in an approved manner, and redrafting the plans using the Department standards. The plans and approvals include, but are not limited to:

- Legislated Environmental Approvals
- Water Resource Permits
- Aggregates Testing Plans and Pit Plans
- Detailed Operating plans

The Consultant shall specify in the Tender Special Provisions any special operating conditions that are not included in the Department’s “Standard Specifications for Highway Construction”.

9.3.1.6 Plan Quality in Tender Package

The consultant shall include legible testing plans and operating plans for any optional source made available for the contract.

If available, the Aggregate Co-ordinator will provide digital Testing Plans and operating plans in DGN or CGM formats. The Consultant shall convert the images into an electronic format for inclusion into the tender document.

In the absence of a digital plan, a blueprint of the original plan will be provided. The consultant shall be responsible for the drafting of a digital plan that meets Department standards, for inclusion in the tender document. Scanned plans are not acceptable.

Along with the full testing plan, the portion of the testing plan to be operated shall be enlarged and included in the tender document. Examples of testing plans are shown in Appendix G. More than one enlarged plan may be required to show the area clearly. Alternately, full size plans in PDF (portable document format) shall be included with the other engineering plans as described in Section 11.1.2 – Design and Tender Package Submission Requirements.

The Consultant shall verify the quality of the plans by printing out the image from the PDF or word perfect file, prior to submission of the tender document.

Current References for Section 9:

Alberta Infrastructure Guidelines for Assessment, Rating and Prioritization of Pavements for Seal Coat, 1997, Alberta Transportation.

Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, 2001, Alberta Transportation.

Pavement Design Manual, 1997, Alberta Transportation.

Pavement Surface Summary (Primary Highways), Current, Alberta Transportation.

Pavement Surface Summary (Secondary Highways), Current, Alberta Transportation.

Standard Specifications for Highway Construction, 2001, Alberta Transportation.

SECTION 9 – SURFACING DESIGN

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SECTION 10 - BRIDGE PLANNING, DESIGN AND INSPECTION

10.1 DESIGN STANDARDS

All design work shall be done in accordance with relevant codes, current Department standards, specifications, and recognized engineering practices.

10.2 ENGINEERING DRAWINGS

The current version of the Department's standard title block shall be used for all drawings. The Department will assign drawing numbers (DD, P, N, S, etc.) for all engineering drawings required to complete projects. These numbers and the standard title block template are issued by the Bridge Standards Technologist, Bridge Engineering Section, Technical Standards Branch, (Tel. No. 415-1042).

Whenever possible the Department's standard drawings shall be used for the construction of bridges and culverts. The drawings are now available at the Department's website (see Section 10.9) under 'Bridge Design Guides'.

Refer to Appendix "J1" for schedule of milestone dates of submission of drawings and reports.

10.3 INDEPENDENT DESIGN CHECK

A complete check of the bridge planning, structural design and drawings shall be carried out by a Professional Engineer other than the Professional Engineer responsible for the design. The Professional Engineer who has undertaken this check shall provide design check notes and shall also stamp, sign and seal the drawings. This independent design check shall be carried out by another Consultant when the design Consultant does not have adequate in-house capabilities to provide this check or if so directed by the Department.

Typically, an "Independent Design Check" involves the following activities:

- Complete review of bridge planning and assessments. Re-analysis using other methodologies is warranted for critical design components.

SECTION 10 – BRIDGE PLANNING, DESIGN, AND INSPECTION

- Complete re-analysis of all aspects of the original structural design, preferably (but not essentially) by a methodology other than that used in the original design.
- Ensuring that the engineering drawings accurately convey the design philosophies of the original design and the checkers design.
- Ensuring the completeness, integrity, and accuracy of all aspects of the Engineering Drawings.

To resolve issues of concern, an independent check of a specific component of the structure may be requested by the Department at any time throughout the design process.

10.4 BRIDGE SURVEYS

Refer to Section 6.1.4.5.

10.4.1 BENCH MARKS

The Department will assign reference numbers for the Bench Mark tablets when applicable (major bridge only). These numbers are issued by the Survey/Imagery Coordinator, Highway Geomatics Section, Program Management Branch. When available, the final geodetic elevation for the Bench Marks shall be incorporated into the As-Constructed drawings and reported back to the Coordinator.

10.5 RIGHT-OF-WAY REQUESTS FOR STAND ALONE BRIDGE PROJECTS

Refer to Chapter 3.

10.6 STAKEHOLDER INPUT

The Consultant shall discuss the proposed alternatives with municipalities and regulatory agencies as required to facilitate stakeholder input and feedback. The Consultant shall formulate a public participation strategy where required. Any strategy not detailed in the project Terms of Reference requires prior approval of the Department.

10.7 APPROVALS, LICENSES AND PERMITS

The Consultant shall ensure all Provincial and Federal permits and licenses are obtained including any required investigations.

10.8 SUBMISSIONS OF DRAWINGS AND REPORTS

Stages of the project that have been identified (in Appendix J1 or the Terms of Reference) as requiring a review by the Department shall be submitted in a timely manner. The submission shall take into account the ‘milestone dates’ that have been specified in the Agreement (or Appendix “J1” in the absence of detailed dates in the Agreement), and allow sufficient time to enable a level of review appropriate to the work involved to be undertaken.

All bridge drawings and reports submitted to the Department must contain a reference to the unique bridge file number (BF#) that has been assigned to the project.

10.9 BRIDGE ENGINEERING WEBSITE

Additional Information on bridge planning, design, construction and standard engineering drawings etc. can be found at <http://www.trans.gov.ab.ca> (as of April 2002).

10.10 BRIDGE PLANNING AND ASSESSMENTS

Unless otherwise noted the provisions of CAN/CSA-S6-00 with reference to Section 1.2.3 Hydraulic Definitions and 1.10 Hydraulic Design shall NOT apply to this work. All bridge planning and assessments shall otherwise be done in accordance with relevant codes, current Department standards and best practices, specifications, and recognized engineering practices. The Consultant shall complete the assessment and bridge planning including summary reports, sketches and/or drawings for the existing and/or proposed bridge structures and/or associated river training protection works, as applicable. Assessments should be used to determine the best course of action for an existing bridge structure such as: should the bridge be maintained, rehabilitated, replaced, widened or eliminated.

SECTION 10 – BRIDGE PLANNING, DESIGN, AND INSPECTION

All major bridge or culvert structures and/or associated river engineering works shall require preparation of Design Data Drawings in accordance with Appendix “J1”.

10.10.1 ASSESSMENTS

The bridge assessment should include when applicable, but not be limited to, the following considerations:

- site history
- traffic flows, patterns, projections, accident records
- future developments
- land use
- train traffic (number, length, speed, number of lines, hazardous materials, etc.)
- hydrology
- hydraulics
- geotechnical factors
- environmental factors
- corrosion survey
- structural conditions and options
- road geometrics
- clearances
- high load corridor (current and future)
- log haul routes (log haul truck dimensions)
- any other factors potentially impacting the recommendation

The Consultant shall undertake an economic evaluation and life cycle costing of alternatives including maintenance, rehabilitation and replacement costs. Existing files and drawings shall be reviewed and the site should be inspected.

10.10.2 BRIDGE PLANNING

The Consultant shall:

- Identify appropriate alignment, location and structure type alternatives (consideration shall be given to right-of-way requirements, utilities, geotechnical and hydrotechnical information, traffic accommodation detour and staging requirements).
- Identify right-of-way requirements.

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- Prepare conceptual alternatives for advancement to Design Data drawing (DD drawing) stage including preliminary cost estimates, preliminary hydrotechnical design, site survey, and appropriate conceptual sketches as well as a draft bridge summary report.
- Complete hydrotechnical, river engineering and geometric design.
- Complete preliminary geotechnical investigation.
- Complete corrosion survey (culverts only).
- Prepare DD drawings and bridge planning summary report as detailed in Appendix “J1”.

10.10.3 SUMMARY OF REPORTING AND SUBMISSION REQUIREMENTS

As applicable, at the conclusion of the Bridge Planning phase, the Consultant shall submit to the Project Sponsor (or already have submitted) the following documentation:

- Bridge assessment report
- Geotechnical Report
- Cost estimates for alternatives considered
- Bridge Concept Approval documentation including supporting technical information and draft Bridge Planning Summary report.
- All applicable environmental impacts, investigations, approval applications and submissions including supporting documentation.
- Navigable Water Protection Act (NWPA) drawings, permit applications, approvals, proof of advertising, etc.
- Railway grade separation drawings, submissions to the Railways (under the “Canada Transportation Act” CTA), and approvals (including the CTA order)
- Fisheries Act submissions and approvals
- Stamped, signed and sealed original Design Data (DD) drawings and Bridge Planning Summary report. The Department may, at its discretion, request that the Consultant retain the DD drawings until the construction contract has been awarded
- Draft of Bridge Planning (DD Drawing) Completion form
- Electronic data files in an accepted format
- Design notes and all other data identified in the Agreement (for record purposes only)
- Geotechnical Report

Final Design Data (DD) drawings and the Bridge Planning Summary report (stamped and signed) are to be received by the Department prior to the “Preliminary

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Engineering (DD Drawing) Completion date identified in the Agreement”. (“Choose Design Completion” may also occur at this time).

For further details of “Reporting and Submission Requirements” refer to Appendix “J1”.

10.11 BRIDGE STRUCTURAL ENGINEERING

The Consultant shall complete the bridge designs for the project as detailed in the following sections:

10.11.1 PRELIMINARY STRUCTURAL DESIGN

The Consultant shall prepare a structure alternatives report for structure options considered suitable for the site (including rehabilitation when appropriate), illustrative drawings, and “B” cost estimates and life cycle cost, etc., for each alternative.

10.11.2 DETAILED STRUCTURAL DESIGN

The Consultant shall prepare a “Project Design Brief” (See Appendix “J1”) for the chosen structure (major bridges and overhead sign structures only) prior to commencement of detailed design. The Consultant shall complete the detailed design and construction drawings for the selected structure, including special provisions, “C” cost estimate, bid items, contract quantities, reinforcing steel bar lists, material lists, etc.

10.11.3 SUMMARY OF REPORTING AND SUBMISSION REQUIREMENTS

At the conclusion of the project, the Consultant shall submit (or already have submitted) the following documentation:

- Preliminary Structures alternative report
- Any outstanding applications, approvals for licenses or permits, etc., required to carry out the work which were not obtained during the bridge planning phase
- Corrosion survey report (culverts only), and life expectancy calculations
- Cost estimates (“B” & “C”) for alternatives considered
- After the contract is awarded, a “D” cost summary will be prepared and submitted to the Project Sponsor with copies to Bridge Construction Specialist, Bridge Engineering Section, Technical Standards Branch, Edmonton

SECTION 10 – BRIDGE PLANNING, DESIGN, AND INSPECTION

- ‘Choose Design’ record
- Project Design Brief (major bridges and overhead sign structures only)
- Draft of “Design Completion” form
- 3 sets of the approved shop or fabrication drawings, erection drawings, stressing, calculations, etc. (2 sets to Fabrication Standards Specialist, Bridge Engineering Section, 1 set to Project Sponsor)
- 5 sets of reduced drawings to Bridge Standards Technologist, Bridge Engineering Section. (These drawings are required in addition to the requirements for plans and drawings prior to tendering as specified in Section 11.1.2.4)
- 9 sets of full size drawings within two weeks after the Contract is awarded (4 sets for Contractor, 3 sets to Bridge Standards Technologist, Bridge Engineering Section, 2 sets to Project Sponsor). The drawings shall be updated to include all revisions to date.
- Design notes and checkers notes (for record purposes only)
- Original stamped and signed drawings, electronic files, and “As Constructed” information, etc. This data is required at the conclusion of the contract (see Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration).

For further details of “Reporting and Submission Requirements” refer to Appendix “J1”.

10.12 MATERIAL FABRICATION AND BRIDGE CONSTRUCTION INSPECTION

The Consultant shall perform quality assurance checks; inspections and acceptance of plant fabricated materials in accordance with Department standards and guidelines. Refer to Appendix J2 for qualifications of materials inspectors.

The Consultant shall inspect the Contractor’s work and ensure that all construction work fully complies with the contract. Refer to Appendix J3 for qualifications of bridge construction inspectors.

For Requirements of Inspection, refer to “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

10.12.1 SHOP DRAWINGS

Refer to “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

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10.12.2 AS-CONSTRUCTED DRAWINGS

Refer to “Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration”.

Current References for Section 10:

- A Guide to Electronic Surveying & Data Management, 1996, Alberta Transportation.
- A Policy on Geometric Design of Highways and Streets, 2001, AASHTO.
- Bridge Code on Fabrication of Structural Steel, 1996, AASHTO.
- Bridge File Maps (by Municipality) (photo grade paper), 1995, Alberta Transportation.
- Bridge File Maps (by NTS Grid) (photo grade paper), 1995, Alberta Transportation.
- Bridge Inspection Manual (BIM), 2001, Alberta Transportation.
- Bridge Inspection & Maintenance System Manual, 1990, Alberta Transportation.
- Bridge Rating - New Rating Truck Models Version 1.00, 1997, Alberta Transportation.
- Bridge Size Culverts (Installation Video), 1995, Alberta Transportation.
- Bridge Size Culverts Design & Draft Guidelines, 1995, Alberta Transportation.
- Bridge Structures Design Criteria Version 4.0, 2001, Alberta Transportation.
- Bridge Welding Code D1.5, 1996, A.W.S.
- Canada Transportation Act, Government of Canada.
- Canadian Highway Bridge Design Code, 2000, Canadian Standards Association.
- Cost Apportionment Guidelines - for railway crossings, 1990, Government of Canada.
- Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration, 2001, Alberta Transportation.
- Fish Habitat Manual, 2001, Alberta Transportation.
- Guide to Bridge Hydraulics, 2001, TAC.
- Guide to Railway Works Cost Apportionment, April, 1997, Rail Infrastructure Directorate.
- Guidelines for Bridge Structures, Standards, Approvals, and Design (SAD Guidelines), 1992, Alberta Transportation.
- Highway Drainage Guidelines (Metric Versions), 1999, AASHTO.
- Highway Geometric Design Guide, 1999, Alberta Transportation.
- Navigable Waters Protection Act, Government of Canada.
- Road/Railway Crossing Guidelines, May 1997, Alberta Transportation.
- Specifications for Bridge Construction, 2001, Alberta Transportation.

SECTION 11 - CONTRACT TENDERING

11.1 DESIGN AND TENDER PACKAGE

11.1.1 GENERAL

The contract tender submission is the end product of the design phase. The accuracy and relevance of the information provided is critical to the bidding process and provides the framework for the construction supervision and contract administration phase.

The Consultant shall undertake an independent check of all submissions in accordance with Section 1.5.8 of these guidelines. A Design and Tender Package shall be submitted by the Consultant to the Project Sponsor. This formal submission shall be accompanied by a signed covering letter from the Consultant and shall include a tender document, all associated plans, drawings and data sheets, design quantity and cost summaries as detailed below. This Package will subsequently be submitted by the Project Sponsor to Professional Services Branch.

The Department recognizes that the current tendering process (and associated contract administration) is very comprehensive. The Project Sponsor may suggest, in the Terms of Reference, alternative tendering/construction processes that will result in economy to the overall project. Similarly, the Consultant is encouraged to suggest alternative tendering/construction processes that can be expected to result in lower overall project costs and do not impose undue risk on either the Contractor or the Department.

11.1.2 DESIGN AND TENDER PACKAGE SUBMISSION REQUIREMENTS

There are four main components to the design and tender package submission: the covering letter, the design submission, the tender documents, and the contract plans and drawings

11.1.2.1 Covering Letter

The covering letter may be submitted in electronic or printed form. The letter shall contain the following information:

- The name, address and telephone number and signature of the Consultant;
- The name, title, telephone number, email address of the designer/contact person responsible for the preparation of the design and tender submission;

SECTION 11 – CONTRACT TENDERING

- The consulting agreement number, tender number, highway/control section number, and the project ID number;
- A list of all enclosures;
- The status of all right-of-way/borrow pit negotiations, if applicable;
- The status of all utility crossing agreements, if applicable;
- The status of all environmental permits, Fisheries and Navigable Waters Authorizations, if applicable;
- The memo shall identify the individual/company that performed the independent check;
- If the “C-Estimate” varies from the most recent estimate shown in the Department’s construction program by more than 20% (either greater or less), the Consultant shall provide a rationale for the variance;
- A list of all Design Exceptions with the approvals of Technical Standards Branch

11.1.2.2 Design Submission

The design shall include:

- Two separate cost estimates, one of which is based on the previous year’s average bid price report, and the second (the “C-Estimate”) which is the estimated cost of the project at the time of tendering;
- Each cost estimate will include Contract Items, 10% Contingencies, Engineering Costs, Right-of-Way Costs, Utility Costs, and any other relevant Project Costs;
- For projects with different types of work, separate cost estimates shall be provided for each component of the work (i.e. grading, surfacing, bridge, etc.);
- All cost estimates shall be provided in electronic form (MS Excel spreadsheet) and in printed format;
- The Unit Price Schedule database created by the Consultant Bid Item System (CBIS) program shall be provided in electronic format

11.1.2.3 Tender Documents

- The tender document shall be prepared in WordPerfect Version 8 format. Electronic conversion from other programs into WordPerfect Version 8 is NOT acceptable;
- All tender documents shall be created using the tender document shell located on the Department’s web site;
- Whenever possible, the tender document shall utilize either standard specifications or the special provisions posted on the Department’s web site;
- Any non-typical special provisions, specification amendments or supplemental specifications shall be created in a format consistent with the Department’s standard specifications;

- Any permits or authorizations, contract plans, pit plans, or scanned images to be incorporated in the tender document shall be scanned using the following settings:
 - Save image as: MS Paintbrush (*.pcx)
 - resolution: 300 dpi
 - image type: line art
 - All scanned images shall be legible in the printed and electronic form
- As a minimum, all tender documents shall include a “Location Plan”

11.1.2.4 Separate Plans and Drawings (if applicable)

Some tenders may require oversize plans or drawings that are intended to form part of the tender documents. Oversize plans are described as plans larger than 22” x 34”. These plans may be required due to the size or detail of a project and are occasionally needed for interchanges, complex intersections, major utilities etc. Whenever possible the Consultant shall attempt to use standard size plans in lieu of oversized plans.

Many tenders have separate plans. Separate plans are needed on grading projects, bridge projects, and some surfacing projects. Typically, separate drawings are 11 x 17 or 22 x 34 inches in size. Separate Plans are considered essential to bidders for the preparation of their bids and one set of 11 x 17 plans is included with each tender document. The full size (22 x 34) plans are available for purchase by interested bidders.

In addition, some tenders may include reference drawings. Reference drawings, which include Utility Plans and as-built drawings are available for purchase by bidders; however, the drawings are not considered necessary for the preparation of bids. Reference drawings may be oversized depending on the size of the original drawing. Reference drawings are normally made available for viewing by bidders in advance of tender closing.

Submission requirements for plans and drawings include:

- The Consultant shall submit one set of mylars to the Project Sponsor with the tender submission. The mylars shall be signed by both designer and checker;
- The Consultant shall provide a CD containing the electronic copies of signed mylars in AutoCAD or Microstation Format. As of Aug 1, 2002 all drawings must be in Microstation compatible format (as per the Drafting Guidelines Manual (CB4)).
- The Consultant shall submit an electronic copy of reduced size (11 x 17) drawings in Adobe Acrobat (*.pdf) format. For the reduced size drawings, photo mosaics shall be turned off. Each Adobe drawing file shall be limited to a maximum of 30 pages per file;

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- The Consultant shall also provide a set of full size (22 x 34) drawings in Adobe Acrobat (*.pdf) format. The full size drawings shall include photo mosaics. Each adobe drawing file shall be limited to a maximum of 30 pages per file and a maximum file size of 2 MB;
- If the tender includes reference drawings, the Consultant shall supply 15 printed and bound sets of the reference drawings with the tender submission. Alternatively, the Consultant may scan the reference drawings and provide the drawings in Adobe Acrobat (*.pdf) format. If the Consultant elects to provide the reference drawings in electronic format, each drawing shall be either expanded or reduced to fit on a standard 22 x 34-inch size.
- For smaller bridge projects, full size drawings are not required unless the plan detail is insufficient for bidders to prepare their bids

11.1.3 TENDER DOCUMENT PACKAGE

The format of the tender document is provided in the Tender Document Template located on the Department's Internet web page. The format of the tender document is as follows:

- Title page
- Table of contents (generated by WordPerfect)
- Instructions to Bidders
- Tender forms
- Unit Price Schedule (created by merging the CBIS database)
- Tender Amendment form
- Special Provisions
- Specification Amendments, where applicable
- Supplemental Specifications, where applicable
- Engineering Plans and drawings
- Contract Plans (location plan minimum)
- Environmental permits, licenses, approvals, authorizations
- Addendums

11.1.4 STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, SPECIFICATION AMENDMENTS AND SUPPLEMENTAL SPECIFICATIONS

The Department's Internet Web Site contains the most up-to-date versions of the tender document templates, bid items, typical Special Provisions, and Specification Amendments.

The web site is located at:

SECTION 11 – CONTRACT TENDERING

<http://www.trans.gov.ab.ca/Content/doctype29/production/pro012.htm>

(as of December 2001)

The Department maintains several specification manuals including the “Standard Specification for Highway Construction” and the “Specifications for Bridge Construction”. Whenever possible, Consultants shall utilize the Standard Specifications rather than creating new Special Provisions. When new Special Provisions are used, they shall be accepted by the Project Sponsor.

In the event that a special provision is required, the Consultant shall first review the typical Special Provisions posted on the Department’s Internet web site. If it is necessary for the Consultant to develop a new Special Provision, the Consultant shall ensure the Special Provision is created in a format that is consistent with the Standard Specifications and the Special Provisions posted on the Internet web site. It is important that the new special provision has been reviewed by the Project Sponsor to ensure that there is no conflict with any other specifications (the Project Sponsor may refer this to the Technical Standards Branch).

11.1.5 ADDENDA

Addenda are revisions to the tender documents that are issued to all bidders during the tender period. Although any number of sources may identify the need for an addendum; the Consultant is responsible for providing the addendum information to Professional Services Section prior to the tender closing date.

Typically, the Consultant shall notify the Project Sponsor, as soon it becomes apparent that changes to the tender documents are required. Where feasible, the Addendum shall be submitted to the Project Sponsor and Professional Services Section on the same working day that the need is identified. If an addendum is submitted to Professional Services less than two working prior to the scheduled close of tenders, the closing date will be extended by Professional Services to allow all bidders the opportunity to evaluate the addendum.

The addenda submission to Professional Services Section shall be in WordPerfect Version 8.0 electronic format. If the addendum includes revised plans, the plans shall be provided in accordance with Section 11.1.2.4.

If the addendum will result in a change to the estimated cost of the project, the Consultant shall provide a revised “C-Estimate” with the addendum submission.

11.1.6 MATERIALS

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Typically, the supply of materials will be the responsibility of the Contractor as part of the construction contract. In the rare instance where material supply is not included in the construction contract, the Consultant shall be responsible for the preparation of material orders for the Department.

11.1.7 REPORTING REQUIREMENTS

Unless otherwise agreed by the Department, the Consultant shall submit the draft design and tender package to the Project Sponsor a minimum of 6 weeks prior to the “Tender Package Submission Date” as stated in the Terms of Reference.

Following the technical review and acceptance of the tender documents by the Project Sponsor, the Consultant shall submit the final design and tender package to Professional Services a minimum of 2 weeks prior to the “Tender Package Submission Date”.

Within two weeks after the Contract award, the Consultant shall submit six sets of full size drawings (4 to the Contractor, 2 to the Project Sponsor). The drawings shall be updated to include all revisions to date.

Current References for Section 11:

Please refer to Appendix “M” for references. Depending on the nature and complexity of the tender there may be many references that apply. Rather than provide a partial listing here, the reader is referred to Appendix “M” for the complete list.

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APPENDIX “A”

GENERAL ENGINEERING PROCESSES

**FOR MANAGEMENT OF ALBERTA’S HIGHWAYS
AND BRIDGES
MAY 7, 2002**

APPENDIX A

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GENERAL OUTLINE OF THE ENGINEERING PROCESS FROM LONG RANGE PLANNING TO CONSTRUCTION COMPLETION FOR PROVINCIAL HIGHWAYS

A. Long Range Planning

1. Alberta Transportation's Mission is to contribute to Alberta's economic prosperity and quality of life through the provision of a safe and efficient transportation network. The Department's Core Business in this regard is to ensure continuous improvement of the provincial highway infrastructure through efficient planning, design, construction, rehabilitation, operation and maintenance.
2. To begin, the Department monitors all Provincial Highways for traffic volume, collision experience, operations, pavement/bridge condition, level-of-service, etc. on a regular basis.

An inventory of existing highways including details of features and appurtenances together with various information regarding condition, age, serviceability, etc. is also maintained and stored in the Transportation Infrastructure Management System (TIMS – expected to be an important tool in establishing future highway programs).

3. Using this information, the Department develops and refines its Long Range Plan which identifies overall transportation needs and priorities for various time horizons (eg. 5, 10, 15 and 20 year) for the entire highway system.
4. At any given time there is a three-year program in place. The three-year program is a "rolling program" which is generally approved in the spring session of the legislature each year and is freely available public information. Projects that are included in the three-year program are subjected to planning, engineering assessment, detailed design, etc. as required to deliver the construction work.

Program Management Branch (PMB) coordinates input from the Regions, Transportation Safety Services Division, Technical Standards Branch (TSB) and other stakeholders, to identify projects for inclusion in the construction/rehabilitation programs. Projects are approved based on demand, needs and available budgets.

A Flow Diagram is attached to show the various stages followed in the Highway Engineering Process for projects in the 3-10 year programs. The "Process of Notification of Provincial Highway Construction Projects to Municipalities" is also attached.

An initial "Scope Review" is undertaken by the Department on all projects or highway segments that are under consideration for the 3-10 year program. This initial scope review is generally undertaken by the Infrastructure Manager with input from other staff and using the most current technical information. The information available may include planning studies, engineering assessments, pavement management systems information, video log, etc. At this time, the Department will make an initial determination of whether the project requires planning, engineering assessment or if it can be advanced directly to the preliminary engineering stage.

B. Consultant Selection

5. The Department employs competent consulting engineering firms registered with the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA). All consultants must be pre-qualified for engineering work required on provincial highway projects.

Sub-consultants and other firms providing specialized services are not necessarily pre-qualified by the Department.

6. A Project Sponsor is designated by the Department to act as liaison between the Department & Consultant. The Project Sponsor is assigned the management duties for the consultant assignment. The Project Sponsor also ensures that funding is in place for the engineering and construction work, that upset fees are not exceeded, and requests increases in upset fees if required and justified. The Project Sponsor takes responsibility for delivery of the project as per the program or other defined schedules.
7. A Terms of Reference (TOR) for a project is prepared by the Project Sponsor based on the project requirements and through consultation with technical specialists or others as required. The TOR defines the scope of work, deliverables and schedules expected by the Department.
8. Professional Services Section (PSS) of PMB administers the consultant procurement process. PSS sends out a Request for Proposal (RFP) through open call or approved short list. PSS receives proposals from interested/short listed consultants and arranges for the selection meeting with the Region and Technical Services to determine the preferred Consultant.

The proposals are evaluated based on specified criteria and a selection of the preferred Consultant is made. PMB obtains approvals and the final terms of agreement are negotiated between the preferred Consultant and the Department. An agreement is prepared by PSS.

9. Sole sourcing is another approach utilized by the Department for obtaining consultant services for specific assignments. Sole sourcing is employed if it is in the best interests of the Department based on value and schedule. Sole source assignments will typically last longer than one week and may require special knowledge or experience. Generally, the scope of work will be clearly defined. For sole source assignments, the Department expects the Consultant to have good knowledge and capabilities in the area concerned as well as a thorough understanding of the effort required to perform the work.
10. In some situations, the Department hires consulting firms to undertake Regional planning or engineering assessments as required to assess the need to reconstruct/rehabilitate existing roads and bridges (These assessments follow the 3R/4R guidelines or other established engineering practices for assessment of roads and bridges. An "A" estimate is submitted as part of the final report on planning work.). For engineering assessments, the type of engineering information provided by these firms consists of geometric assessment, surfacing strategy, safety assessment, railway crossing improvement requirements, lighting assessment, traffic signal assessment, seal coat requirements, etc. The production of construction cost estimates that are more detailed and reliable than the programming estimate is part of an engineering assessment. (For surfacing work a "B" estimate is

produced at the preliminary stage. Because the need for geometric improvements is defined at this stage, the original ballpark “A” estimate for roadway grading/base/paving may be fine-tuned accordingly.).

11. Generally, the engineering work required for preliminary engineering, detailed design, tender preparation, construction supervision and contract administration are bundled together in one assignment.

C. Consultant Roles

12. Following the assignment of a project to a Consultant, the Project Sponsor calls a Project Initialization Meeting with the Department’s Project Administrator, Consultant and the Department Safety Officer to review and clarify project scope, roles, schedule and requirements.
13. The Consultant performs the detailed engineering work using all relevant manuals, guidelines and practices that apply to highways in Alberta. This includes but is not limited to the following Department documents:
- i) Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 1 – Design and Tender (this document).
 - ii) Highway Geometric Design Guide.
 - ii) Traffic Control Standards Manual.
 - iv) Pavement Design Manual.
 - v) Canadian National Bridge Code.
 - vi) Bridge SAD (Standards, Approvals & Design) Guidelines.

The Consultant submits all deliverables as noted in the Terms of Reference including right-of-way plans, right-of-way agreements, utility agreements, environmental permits, licenses and approvals.

The Consultant submits a “B” estimate to the Project Sponsor on completion of preliminary designs.

The Consultant prepares grading, surfacing, and bridge design packages which are used as the basis for preparation of the contract tender.

The Consultant delivers a completed and independently checked design, mosaics, drawings and electronic copies which include summaries of all estimates including a “C” estimate for project expenditure.

The Consultant submits the tender package to the Project Sponsor as per the schedule specified in the RFP/TOR and as may be adjusted by the Department.

As required, the Consultant calls for a Design Review Meeting(s), a Pre-Tender Meeting and a Pre-Construction Meeting.

D. Tendering Process

14. The Project Sponsor checks the tender package for completeness and accuracy including the clarity of the Special Provisions, and updates the program dollars as required and justified based on the Consultant's "C" estimate.

The Project Sponsor forwards the tender package to PSS. PSS does a high level check of the contractual items to ensure that the document is suitable for tendering.

15. All projects over \$100,000 are advertised and tendered by PMB. PMB obtains approval to tender and advertises the tender in the Construction Alberta News, the MERX electronic tendering system and the Alberta Construction Association's COOLNET electronic tendering system.

Copies of the contract tender documents are distributed to the pickup centers.

16. Generally, the Regions advertise and tender contracts where the estimated contract cost is less than \$100,000.

Where regional tenders are based on either lump sum or unit price quotation, the Department obtains quotes from at least three sources. The Consultant evaluates the quotes and submits the recommendations to the Department for approval.

E. Construction Administration (Volume 2 of this document)

17. Throughout the project, the Consultant provides project management and submits weekly reports complete with relevant comments on material testing to the Project Sponsor.

The Consultant submits monthly invoices for engineering fees as well as project expenditure reports for construction activities on a timely basis to the Project Sponsor. In addition, the Consultant certifies and submits contractor invoices to the Department for payment.

The Project Sponsor monitors construction activities and progress of individual construction projects, liaises with consultants and contractors, and provides monthly progress reports to PMB.

As required, site visits are conducted by representatives from the Region, Technical Standards Branch (TSB) and PMB to monitor various aspects of the project such as construction supervision, adherence to specs/standards, compliance to terms of Agreements, and public/worker safety.

18. The Consultant initiates contract changes (ie. changes in scope of work, estimated cost) within certain defined limits.

19. The Consultant performs segregation inspection and rating of finished pavement surfaces within the time limits required in the contract specifications. A segregation rating sheet is filled out to calculate bonuses and penalties.

The Project Sponsor generally visits the site to satisfy himself that segregation has been adequately rated and deficiencies were corrected.

-
20. The Consultant calls for a Final Inspection tour when the Contractor advises the Consultant that the project is complete.
21. Upon completion of the project, the Consultant indicates to the Project Sponsor that the work is complete. A conditional Construction Completion Certificate is issued advising the Contractor of all outstanding work (ie. seasonal deficiencies), the date by which this work is to be completed and the amounts to be retained in holdbacks for the work (at least twice the estimated cost of the remaining work).

Unless otherwise notified, the Consultant Project Manager holds back 10% of progress payments.

In general, the holdback is retained until:

- i) Contract has been accepted as complete.
 - ii) Contractor's Statutory Declaration has been received.
 - iii) W.C.B. clearance has been received.
22. When the construction contract has been completed, the Consultant submits the complete "Final Details" and Project Records file to the Projects Sponsor. Selected road and bridge information (ie. As-Constructed Details/Drawings, design calculations and checker notes for bridges, etc.) is forwarded by the Project Sponsor to Highway Engineering Section, TSB. Highway Engineering Section is responsible for passing the information to the appropriate Section in the Head Office for processing and subsequent record retention. Consultants must follow TSB standards for file identification.

The department does not pay for any post-construction engineering work until the complete "Final Details" and Project Records file has been received.

Rationale for collection of as-built information is as follows:

- i) Information on bridge structures is needed for load ratings.
- ii) Pavement width and thickness information is needed for pavement management purposes.
- iii) Information on geometry/traffic control is needed for future assessment of improvement needs, investigation of need for additional traffic control devices and lighting, for on-going monitoring of safety performance and to record drainage information.
- iv) To generate year-end summary reports on construction quality.

All of the above information will be stored as part of TIMS and will be available for future programming, design and management purposes.

The Consultant retains a complete duplicate copy of the "Project Records Package" which is described in Appendix "K" of this document. The "Project Records Package" includes the Final Details as well as design information, correspondence and other pertinent records.

23. Upon request from the Contractor, the Consultant releases electronic files for earthwork quantities to the Contractor once the files have been edited and verified.

24. The Project Sponsor completes an evaluation of the Consultant with input from the Department Safety Officer. The evaluation form is signed by the Consultant and Project Sponsor.

F. Warranty Inspection

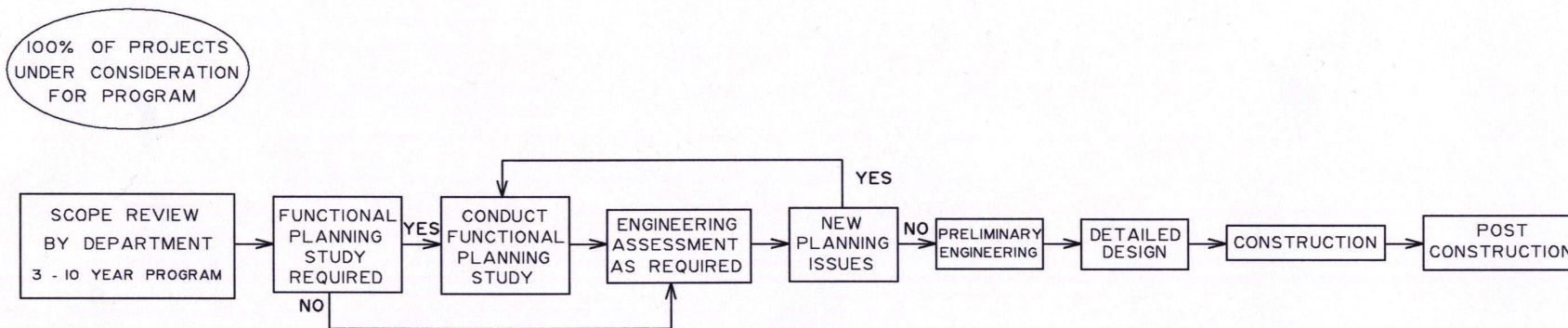
25. As required, a Warranty Inspection is done 30 to 60 days before the expiration of the warranty period. The warranty period is generally 12 months for roads and 24 months for major bridges. Some aspects of the workmanship or materials require longer warranties (e.g. bridge joints and bridge bearings – typically a 5 year warranty period is specified.) The warranty inspection is undertaken by a Regional Warranty Inspection Consultant if required.

If deficiencies are found, the Consultant informs the Contractor in writing advising him of the defects and specifying a completion date for the repairs. A copy of the letter is sent to the Project Sponsor, PMB and the bonding company.

If the Contractor fails to complete the repairs before the end of the warranty period, the bonding company is asked to complete the repairs.

FLOW DIAGRAM

HIGHWAY ENGINEERING PROCESS



NOTE: PLANNING STUDY TRIGGERS

- ACCESS MANAGEMENT
- MAJOR R/W IMPACTS
- PUBLIC CONSULTATION
- REALIGNMENTS
- MAJOR INTERSECTION OR INTERCHANGE REQUIREMENTS
- TWINNING

**PROCESS OF NOTIFICATION OF PROVINCIAL HIGHWAY
CONSTRUCTION PROJECTS TO MUNICIPALITIES**

Recommended Steps to Follow	Responsible Party
1. As part of the Terms of Reference development, contact the municipality to advise them of the upcoming work and that the Consultants may be requesting information from the municipality as part of RFP development	Project Sponsor
2. Include in the Request for Proposal (RFP) a statement to the effect that the successful consultant will contact the municipality after they are awarded the project engineering work and gather input from them.	Project Sponsor
3. Invite municipality representative to the project initialization meeting and conceptual design meeting (as required)	Project Sponsor
4. Include municipality representative in the value engineering sessions. Invitation is at the discretion of the Department.	Project Sponsor/Consultant
5. Provide notice of the project tender to the municipality. Professional Services will forward a copy of the "Approval for Advertising" sheet to the project sponsor to forward to the municipality	Project Sponsor
6. Advise the municipality which contractor is awarded the construction contract and anticipated start date.	Consultant
7. Invite municipality to the Pre-Construction meeting (if warranted). Copy the municipality on the notes of meeting.	Consultant
8. Involve municipality representative in the interim inspection if there is an anticipated significant impact to their network or local issues identified	Consultant
9. Elevate recommended changes to this process to the Divisional Executive Managers	CPMG Executive Sponsor

APPENDIX “B”

TYPICAL AGENDA FOR CONSULTANT INITIALIZATION MEETING

APPENDIX B

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Consultant Initialization Meeting - Provincial Highway Project's Agenda

- 1) Safety (separate meeting for Pre-Engineering activities) _____

- 2) Details of Aggregate Source
 - Status of Pit Update _____
 - Pit Operations Plan and Conditions _____
 - Pit Reclamation if necessary _____
 - Contract and Design Packages _____
 - Status of reporting to Department _____

- 3) Description and Scope of Work _____

- 4) Review of Consultant Proposal/Terms of Agreement
 - Items to clarify _____

- 5) Review Administrative Items
 - Consultant Personnel _____
 - Project Communications _____
 - Project Schedule (Milestone dates) _____
 - Project Reporting _____
 - i) Review Department Reporting, Structure, i.e., Weeklies, etc. _____
 - ii) Control Cost Sheet for Invoices (sample) _____
 - iii) Forms, i.e., Expenditure Reports, Change of Scope _____
 - Outline Consultant Performance Evaluation Criteria, i.e., Milestone Dates, Quality, Safety Administration, Weighting Factors, Expectations, Timeliness of Reporting, etc. _____
 - "B" estimate at conceptual design stage. Provide explanation for differences.
 - "C" estimate at design completion (One based on previous year Provincial average cost, and one based on site specific conditions). _____

- 6) Details supplied to the Consultant
 - Contract Number _____
 - Program "A" Estimates for review. Provide PR's, Scope of Work, Cost Breakdown _____
 - Unit Price Schedule (if necessary) _____
 - Any pertinent Background _____

- 7) Other Items
 - Add-ons _____
 - Bridge Files, Bridge Permit Information _____
 - Special Provisions in Tender package (i.e. Liquidated Damages, Site Occupancy) _____
 - Coordination of Utility Agreements _____

8) Finals

- Copies of Finals Documents Package to be included as follows:

- i) Summary Report (2 copies) _____
- ii) Final Estimate (1 copy) _____
- iii) Grand Summary (3 copies) _____
- iv) Final Details Checklist (3 copies) _____
- v) Widths and Thickness Diagram (3 copies) _____
- vi) E.P.S. Bonus payment Backup (3 copies) _____
- vii) Aggregate Removal Report (Dept. Source only) (3 copies) _____

APPENDIX “C”

ENVIRONMENTAL CONSIDERATIONS

APPENDIX C

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PROVINCIAL GOVERNMENT REFERRALS

A) Planning Studies

The Roads and Reclamation Unit of Alberta Sustainable Resource Development shall be contacted as soon as a project is initiated advising that project will be undertaken. A letter giving a description of the project including the proposed time frame for the project shall be submitted to the Roads and Reclamation Unit, accompanied by a plan at the appropriate scale showing project limits. As the project proceeds to define more clearly the roadway alignment, the Consultant shall supply plans and records of decisions. At the completion of the project with alignment finalized and approved, the Roads and Reclamation Unit shall be advised and provided as necessary with copies of plans and reports.

Listed below are minimum plan scales to be provided by the consultant.

Project initiation Map (Plan) Scale 1:50,000.

Corridors Defined Map 1:20,000.

Preliminary Recommended Alignment within corridor defined 1:10,000 map. Preliminary environmental overview including historic resource overview to be provided (see Appendix D).

Recommended Alignment 1:5000 plans. Environmental overview completed including historic resources overview.

B) Roadway and Bridge Preliminary Engineering

i) For Projects Where Grading Or Surface Disturbances Are Involved

The Roads and Reclamation Unit shall be advised that the project is proposed for construction, and that preliminary engineering work will be undertaken. A plan showing the proposed project shall accompany any correspondence. This information shall be provided a minimum of one (1) month prior to project commencement. If a Historic Resources Overview has not been completed at any time prior, one shall be undertaken.

ii) For All Other Projects

This could involve projects where a pavement overlay would be involved. No referral to the Roads and Reclamation Unit is required.

C) Final Design Review

Close contact between the Engineering Consultant and Alberta Environment, and Alberta Sustainable Resource Development field staff is required at this stage of the project. Their input may have a major impact on design requirements. The final roadway or bridge design plans must be submitted to the Roads and Reclamation Unit a minimum of six (6) weeks before the tender advertising date. Where possible, an even longer lead time (for example 12 weeks) is desirable to ensure that conditions imposed by regulatory agencies can be addressed by consultants in the tender documents. A minimum of 6 copies of the plans must be provided.

FEDERAL ENVIRONMENTAL REQUIREMENTS

1.0 INTRODUCTION

In 1995, the Canadian Environmental Assessment Act (CEAA) was proclaimed. This Act sets out responsibilities and procedures for the environmental assessment of projects involving the federal government. All projects that are covered by CEAA and for which the federal government has a decision-making responsibility (fiduciary duty), whether as a proponent, regulator, land manager, or source of financial assistance, are required to undergo an environmental assessment.

2.0 PROJECT REQUIREMENTS

CEAA has a number of requirements leading to a decision as to whether or not an environmental assessment is required.

2.1 Do you have a project?

A project is defined as

- a) In relation to a physical work, any proposed construction, operation, modification, decommissioning, abandonment, or any other undertaking in relation to that physical work.
- b) any physical activity not related to a physical work that is prescribed or is within a class of physical activities that is prescribed in the Inclusion List Regulation.

If the proposal is a physical work or physical activity, it is considered a project.

2.2 Does the project need to be assessed?

The project must be assessed if one of the following occurs:

- 1) has a federal proponent
- 2) receives certain federal financial assistance
- 3) requires the use of federal lands
- 4) requires federal approvals related to the Law List Regulation

2.3 Is the project excluded from undergoing an environmental assessment?

The Exclusion List Regulation indicates the following requirements for excluding a project from an environmental assessment:

- S.15 road expansion or modifications, to occur on an existing road right-of-way, that would not lengthen the road, that would not widen the road by more than 15%, that would be greater than 30 metres from a body of water; and, which would not likely pollute a water body

S.43 modification of that part of a culvert, not connected to a water body, that crosses under a railway or a road within the railway or road right-of-way.

2.4 Is your project on the Comprehensive Study List?

This list lays out projects that have the potential to result in significant environmental effects regardless of the location. The following condition must be met.

S.29 The construction of an all-season public highway more than 50 kilometres in length on a new right-of-way or leading to a community that lacks all-season public highway access.

If the project is not described on the Comprehensive Study List, it will have to undergo an Environmental Screening Report.

3.0 ENVIRONMENTAL SCREENING REPORT

The Environmental Screening Report (ESR) must be undertaken by the proponent and shall include consideration of the following factors:

- a) the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out.
- b) the significance of the environmental effects identified above.
- c) comments from the public.
- d) technically and economically feasible measures that would mitigate any significant adverse effects.
- e) any other matters, such as need for the project and alternatives to the project.

The following valued ecosystem components (VEC) shall be addressed:

- i) surface/ground water
- ii) air quality
- iii) noise
- iv) land/soil
- v) flora
- vi) fauna
- vii) habitat
- viii) special places (cultural, traditional, historical, scientific)
- ix) health and safety
- x) socio-economic

xi) aesthetics

Once a Screening Report is completed the responsible authority makes one of the following decisions:

- a) Project is likely to cause superficial effects, it can proceed.
- b) Project is likely to cause unacceptable effects, it is rejected.
- c) Impacts of the project are uncertain, it is referred to Minister (Federal D.O.E.) for panel or mediation.
- d) If there is a significant public concern, it is referred to Minister (Federal D.O.E.) for panel or mediation.

It should be noted that, if Points (c) or (d) are involved, then Alberta Transportation may be required to undertake additional environmental studies.

For lands that are under control of the federal government, the Canadian Environmental Assessment Act applies. For the most part, an ESR will be required.

The ESR shall be undertaken as soon as the requirement for federal lands is identified. At that time, contact must be initiated with the appropriate federal department to determine their exact requirements.

4.0 PROPERTY ACQUISITION & DISPOSAL

4.1 Property Acquisition

Where a Planning Report has been prepared on behalf of Alberta Transportation, and when Federal lands are affected, contact with the appropriate Federal department should have been initiated. Where no Planning Report has been prepared, contact with the appropriate Federal Department should have been initiated through the consultant and the Regional Property Manager.

4.2 Property Disposal

Alberta Transportation may, at times, wish to return land to control of the federal government. Before the federal government can accept property, an Environmental Site Assessment (ESA) must be conducted. The ESA should conform to requirements laid down by the Canadian Standards Association or Canada Mortgage & Housing Corporation.

5.0 OTHER FEDERAL REQUIREMENTS

Other federal acts may trigger an environmental screening report under CEAA. Of note are the Fisheries Act and Navigable Waters Protection Act. Roadway construction and maintenance activities may trigger one or more sections of these acts due to the type of

activities being conducted. Care must be taken at the initiation of a project in order that these requirements are properly addressed.

APPENDIX “D”

PLANNING REQUIREMENTS

APPENDIX D

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MOSAIC PRODUCTION

The Department has moved towards the use of ortho-rectified mosaics. This is the Departments preference unless otherwise indicated that scale-corrected mosaics are acceptable.

Mosaics are to be produced digitally using the appropriate software. For ortho mosaics the raster is to be corrected to a base map consisting of parcel mapping and the Provincial Digital Elevation Model (DEM). For improved accuracy, particularly projects that have a lot of terrain relief, contour mapping may also be supplied or requested to aid in scale correction of the raster.

If only scale-corrected mosaics are requested, then the raster is corrected to a base map consisting of parcel mapping. In either case the base map is to be based on the 3-TM, NAD 83 coordinate system and the appropriate base longitude. Phone Highway Geomatics to confirm the base longitude for the project. The scale and date of the aerial photography used is to be determined by the Department.

The aerial photography that is used for scanning can be in either print or diapositive format. The photography is to be scanned at a minimum resolution of 600 dpi. Tone matching between aerial photographs is required when more than one aerial photograph is needed for a mosaic sheet. The flight line number, aerial print number, and the date of the aerial photography is to be recorded on each mosaic sheet.

The typical standard mosaic sheet format to be used will be supplied by the Department. The mosaic sheets are to be positioned on the base map so that the highway alignment is approximately centred within the sheet. Additionally, the mosaic sheets are to be positioned to allow for approximately 300 metres of overlap on each side of each sheet for adjacent sheets. Extra overlap between sheets may be required to compensate for additional length in the profile as the result of horizontal curves.

The design files are to be rotated about the origin point to an angle of 0 degrees. The design files supplied to the Department are to be compatible to 'Microstation SE'.

The scale corrected rasters are to be rotated to an angle of 0 degrees and clipped to fit within the reference points on the mosaic sheet. The raster files supplied to the Department are to be in a format that is compatible with 'Intergraph I/RAS C'.

The design files and clipped rasters are to be plotted at an angle of 0 degrees and at a minimum resolution of 400 dpi. Plotting is to be done on a dimensionally stable mylar that is between 0.03mm and 0.04mm in thickness. The plotting device is to be able to produce a permanent non-smearable plot. The maximum allowable scale error of the plotted mosaic sheet measuring between the corner origin points is 2mm.

The maximum allowable error in the accuracy of the raster to base map within the clipped area is 1mm. The maximum allowable error between adjacent mosaic sheets in the overlapping areas is 1mm.

The mosaic/raster files are to be supplied to the Department at the completion of the project. The Departments preference is to receive this information on CD-ROM.

APPENDIX D

Following is a list of file extension naming conventions that are to be used:

- OS1,.OS2 for mosaic sheets from number one to nine.
- 010,.011 for mosaic sheets from number ten and greater.
ie. HWY2.OS1,HWY2.010

- EXT for raster files. ie H2SHTO1.EXT
- DET for mapping detail design files.
- LGL for base map design files.
- PRO for profile design files.
- CON for contour design files.
- ALI for alignment design files.

BASIC RIGHT-OF-WAY REQUEST

For the purpose of purchasing the basic highway right-of-way, the Engineering Consultant will provide right-of-way information on 1:5000 scale digital photo mosaics. These mosaics are in addition to the mosaics prepared for the functional planning study and are to be constructed to the standards as outlined in Schedule 1. The mosaics should show clearly and concisely all right-of-way requirements. The Consultant is to provide one set of black and white Mylar/film in addition to seven (7) sets of colour paper prints. Prior to submission of the complete package, 2 coloured copies marked Draft are to be provided to the region for review.

A thorough and current title search is required on all lands affected by the project. All encumbrances must be reviewed. All encumbrances in the name of Her Majesty the Queen (Minister of Transportation) must be reviewed through the Regional Property Manager for clarification of the nature and extent of the encumbrances/caveats. The date of the title search should be clearly labeled on the mosaics under the title block. In addition, the following information is to be shown clearly on the mosaics:

- Land ownership, which is to include the landowner's name and current address, the amount of right-of-way required from each parcel or land affected in both acres and hectares. (Right of Way area calculations to be indicated to the nearest 0.1 acres / 0.01 hectares), land title certificate number, legal description, and/or plan number all labelled within the owner's property. In the case where the parcel of land is too small to record the information within the property boundaries, the information may be shown outside the property with an indicator arrow.
- Show all Certificate of Title boundaries, surveyed rights-of-way, easements, service road dedications etc.
- Any changes or relocation of existing accesses must be shown including alternate means of access. (e.g. service road, or local road, private drive).
- Indicate the area of all cutoff parcels or severed land that should be considered for optional purchase by Alberta Transportation or consolidation with adjacent properties.
- Show all dimensions of the proposed and existing right-of-way as well as the additional right-of-way requirements, showing the difference between the two.
- In areas such as subdivisions, towns etc. where there are properties too numerous to show the required information clearly at the 1:5000 scale, a more detailed plan at a suitable scale may be required. Details on these plans will follow the same requirements as stated in Schedule 1 and this document.
- In areas through crown lands the consultant is to conduct a Land Status Automated System (L.S.A.S.) search for all existing land use interests (ie. Leases, license of occupation, and other related agreements) to the affected lands. The consultant is to obtain any plans/sketches that are within the proposed highway right of way area complete with ownership of the interests (if available) and record this information on the mosaics to the aforementioned standards.
- In areas through Special Areas Board land, a Special Areas Board search must be conducted to identify occupants.

APPENDIX D

- All work is to be conducted in accordance with the STANDARDS AND GUIDELINES section in the attached Terms of Reference.
- Identify potential contaminated sites.
- All mosaic updates and revisions must be consecutively numbered, beginning with Right of way request #1.
- It is required that all right-of-way requirements are to be shown on the mosaic prints highlighted with shading in the appropriate colour to the following format. A colour legend indicating the following must be shown adjacent to the title block, on each mosaic sheet.
 - Right-of-way required..... RED
 - Previously requested right-of-way GREEN
 - Cancellation of previously requested right-of-way YELLOW
 - Requested easements ORANGE
 - Optional purchases CROSSHATCHED (RED)
 - Possible borrow locations..... 10cm diam. RED CIRCLE
- Each mosaic sheet title block must indicate “Preliminary Design”, the date of mosaic preparation, and “Right of Way Request #”.

Required information	<i>Sample of preferred format</i>
Legal Description C. of T. number Landowner name/s Landowners address R/W required (Provide separate areas for highway r/w and Service road r/w) (Red) Previously requested r/w (Green) Cancellation of previously requested r/w (Yellow) Requested Easement (Orange) Optional purchase (Cross Hatched Red) Possible borrow locations (Red Circle 10 cm dia.)	NE 27-73-4-W6M or Plan Number 962 305 963 Bob Smith and Cathy Smith Box 1234, Worsley, AB T0H 3P0 Required Highway R/W - 5.9 ac (2.38 ha) Required Service Road R/W - ac (ha) Previously requested R/W – 5.2 ac (2.10 ha) Cancelled R/W – 2.5 ac (1.01 ha) Easement – 1.3 ac (0.5 ha) Optional purchase / cutoff –29.6ac (11.98 ha) Total R/W required - ac (ha) Possible borrow location – 10 cm diam. Red circle Note: Use only the headings that are applicable.

<ul style="list-style-type: none">- Information to be indicated in the upper right corner (Title Block)- A Right of Way request form is required for each revision to the r/w requirements	Right of way Request # 3 - June 21, 1999 Preliminary Design, For Discussion Purposes Only
---	--

Consultant Logo
In this area

RIGHT-OF-WAY REQUEST

PROJECT DESCRIPTION:

TO:	LEGAL DESCRIPTION:	FILE:	
	<i>(You can refer to attached RIGHT-OF-WAY PROGRESS ACQUISITION SUMMARY if multiple legal description)</i>	DATE:	
		REQUEST NO.:	
		PRINTS ATTACHED:	YES/NO
		NUMBER OF PRINTS:	

INDICATE (X) IF APPLICABLE	TYPE OF REQUEST	COLOUR ON PLAN
	RIGHT-OF-WAY REQUIRED	RED
	PREVIOUSLY REQUESTED RIGHT-OF-WAY	GREEN
	CANCELLATION OF PREVIOUSLY REQUESTED RIGHT-OF-WAY	YELLOW
	EASEMENT BEING REQUESTED	ORANGE
	OPTIONAL PURCHASED	CROSS-HATCHED (RED)
	POSSIBLE BORROW LOCATIONS	10mm DIAM. RED CIRCLE

Justification:

Estimated Funding Requirements:

Additional Remarks:

Required by: *(Name and signature)*

Project Sponsor's approval

cc: Property Manager (1 mosaic)

Note: Please send one set of the mosaics with this request. The additional mosaics will be required after approval.

RIGHT-OF-WAY PROGRESS ACQUISITION SUMMARY

HIGHWAY NO.:

PROJECT NAME:

ACQUISITION CONSULTANTS:

File No:

Report as of:

Property No.	CsIt REF No.	Name	Legal Description	Certificate of Title	BASIC R/W REQUIRED				ADDITIONAL R/W REQUESTED		
					Area Required (ha)	Area Required (ac)	Area Purchased (ha)	Date of Purchase	Area Required (ha)	Area Purchased (ha)	Date of Purchase
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
		Total			0.0000	0.0000					

HISTORICAL RESOURCES OVERVIEW SCOPE OF WORK

The Historical Resources Overview shall be designed to review current historical resources location data, topography, disturbances, and sedimentary regimes to develop a model of historical resources potential of the proposed development area. The objective of this study is to identify those areas, if any, for which a Historical Resources Impact Assessment is needed. The Overview shall include:

Examination of site data files maintained by Alberta Community Development for archaeological and historic sites and sensitivity maps for palaeontological concerns;

Summary description and evaluation of known sites within the development zone with a particular focus on site location and function variables;

Making full use of ancillary data such as ethno graphic, ethno historic, environmental and paleo-environmental studies;

Developing a model of historical resources potential for the impact area based on known data, topographical potential, models of land use and site distribution;

Ground truthing to consist of evaluating terrain potential for historical resources, assessing the degree of previous disturbance and evaluating sedimentation and it's effect on field methods such as the need for deep testing. The discovery of historical resources *per se* is not the objective of the ground truthing stage; and

Formulating detailed recommendations regarding the need for a Historical Resources Impact Assessment, and the locations, scope and methods necessary.

ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Information on the following Valued Ecosystem Components (VEC) must be collected in order to ensure that the effect(s) of the proposed roadway alignment or improvements on the environment can be determined. The significance of the impact of the roadway on the environment shall be determined and the mitigation measures recommended to decrease the roadway impact on the VEC.

I. **Surface/Groundwater**

A review of surface water patterns throughout the study area shall be conducted. Areas suspected to have groundwater concerns should be identified. Any unusual areas where surface/groundwater problems may occur should also be identified. Proximity to water wells, dugouts?

II. **Vegetation**

An inventory of vegetation communities in the study area or along the alignment(s) shall be conducted. Rare, threatened or endangered species and communities should be identified.

III. **Wildlife**

The study area or alignment(s) shall be reviewed for the presence of any wildlife. Rare, threatened or endangered species should be identified along with any habitat utilized for any portion of their life stage.

IV. **Fisheries**

The study area or alignment(s) shall be reviewed for the presence of fish and fish habitat in all watercourses. Where no information is available, then a fisheries inventory and a fish habitat assessment shall be undertaken. Rare, threatened or endangered fish species or habitat should be identified.

V. **Historical Resources**

Refer to Historical Resources Overview Scope of Work on previous page.

VI. **Soil/Landforms**

Soils shall be classified according to the Canadian System of Soil Classification or other common systems recognized in Alberta. Representative topsoil depths should be identified and any special concerns with soil handling procedures should also be identified. Landforms within the study area or along the alignment(s) should be identified and any special properties regarding the landforms should also be identified.

LOCATION SURVEY REQUIREMENTS

Location surveys may be required on zone planning project, in which case this need will be identified in the project "Terms of Reference". The purpose of the Location Survey is to accurately establish the recommended alignment on the ground to ensure that it fits to the surrounding terrain and to confirm that there are no additional impacts that will affect the highway location. The alignment as established on the ground will be used to establish the alignment for a preliminary survey at a later date. Note that a Locations survey is not a preliminary survey and may require that the horizontal alignment be revised and resurveyed a number of times to achieve optimum placement.

Required Tasks

- the recommended alignment is to be tied to the Alberta Survey Network (3TM, NAD 83 co-ordinate system) and based on the appropriate base longitude so the alignment can be plotted graphically and accuracy of the survey can be confirmed.
- obtain written permission of landowners/leaseholders for access to land where applicable.
- establish tangents and points of intersection (PI's), points on tangent (POT's), and ends of curves along the recommended alignment. The POT's and ends of curve's are to be referenced with offsets at 90 degrees to the centre line tangents a distance that is outside the proposed right-of-way width so that the alignment can be easily re-established at a later date for a preliminary survey. A metal rod approximately 30 centimetres in length should be used, where appropriate, and countersunk a minimum of 30 centimetres below the ground especially in cultivated areas.
- all centreline points, offset points and ends of curves are to be clearly marked with 1" x 2" marker stakes and a marker lathe bearing the appropriate centreline chainage. For offsets the offset distance and direction from centreline should be clearly marked on the reverse side of the marker stakes.
- where applicable the recommended alignment is to be tied to all legal survey pins in the immediate vicinity.
- all curves and tangents are to be staked at 20 metre intervals.
- a centreline profile is required using geodetic datum. All natural breaks in the terrain that do not fall within the 20 metre staking are to be recorded.
- spot cross-sections in critical areas along the alignment are required to ensure the alignment fits to the surrounding terrain.
- additional profiling to geodetic datum is required along all public access roads to a minimum distance of 300m. Some access roads may require longer profiles depending on the terrain.
- chainages are to increase from south to north and from west to east.

- transit notes are required detailing all existing features in the vicinity of the recommended alignment. In forested areas the type and general size of the trees are to be recorded.
- all original curve/transit notes, centreline profile notes and bench mark level notes are to be recorded in appropriate note books and supplied to Alberta Transportation upon completion of the survey.
- the recommended alignment is to be plotted on the mosaics using the field co-ordinates and chainages obtained from the survey. All PI co-ordinates are to be recorded on the mosaics in table form on their respective sheets.
- at the request of Technical Services a standard bridge survey may be required for selected water course crossings. If required this issue will be covered in a separate Schedule included with the Terms of Reference.
- safety procedures for survey crews are to be adhered to at all times (adequate warning signs and flag people if necessary, etc.)

TYPICAL PLANNING STUDY PROCESS FOR MAJOR FUNCTIONAL PLANNING STUDIES

PUBLIC PARTICIPATION AND PROJECT APPROVAL

(Under the direction of the Technical Review Committee)

(NOTE: This process may vary depending on the type of project)

Send letter from Minister to MLA informing of upcoming study.

Send letter from Consultant to Local Authority informing of study initiation

Notify by letter, all adjacent landowners, of project initiation (consultant)**

Meet with Local Authorities and/or major stakeholders to identify issues (consultant and AT if meeting with council members)

Develop conceptual plans for presentation at first public open house meeting

Meet with MLA's (if required), Consultant and AT.

First open house (complete the following tasks as part of "open house procedure")

- Review the consultants advertisement, coverage and strategy (AT)
- Notify by letter, the MLA's local authorities, adjacent landowners and stakeholders of public meeting data (Consultant) **
- Advertise in local media of upcoming open house (consultant)**
- Hold first open house to present broad concepts for discussion purposes (consultant, right of way agent and AT)

Hold individual discussion with concerned landowners (consultant and right-of-way agent or other AT representative)

Develop more detailed plans based on input from first open house and discussion with landowners and stakeholders (consultant)

Hold second open house and repeat all tasks in "open house procedure" to present findings from first open house and revised plans (Consultant, R/W agent and AT).

Prepare draft report for review by technical review committee (consultant)

Present recommendation and obtain acceptance from AT Divisional Executive Committee (consultant)

Prepare necessary documentation for briefing outlining recommendations and public feedback for the Deputy Minister and the Minister (consultant)

Send letter from the Minister to the MLA's advising the results of the study and the date of the third open house (consultant to prepare draft letter)

Hold third (final) open house to present final recommended plan and repeat all tasks required in "open house procedure" (consultant right of way agent and AT)

Send letter to MLA's informing of completion of study and future actions

Prepare a letter for the signature of the Regional Director (Consultant). Send this letter and plan to landowners indicating:

- status of recommended plan
- general data of construction
- right-of-way requirements
- timing of right-of-way purchase (AT R/W Contact Person)
- AT's contact person and telephone number (Regional Director)

** A statement is provided in all letters to the public, newspaper advertisements and an open house questionnaire's indicating a specific contact person and collect telephone number for the consultant.

Indicates enhancements to the public participation process

Note: There could still be some stakeholders who may not be satisfied with the recommended plan. Every effort will be made to mitigate the individual's concerns/issues through on going discussions.

Communications Procedures for Open Houses

Advertising

It is the consultant's responsibility to ensure that all stakeholders are aware of any open house or public meeting(s). The consultant will work within newspaper(s) deadlines to ensure ads are placed in the appropriate newspaper(s).

The consultant will:

- Develop ad copy using the template provided by Alberta Transportation (consultant's and Transportation's logos to appear on the bottom of the ad – Transportation logo to appear on the right hand side)
- Provide a list of newspapers where the ad will be inserted and list insertion dates, and book space in newspaper(s) for insertion at least one week before the event
- Submit draft copy for approval to Communications **at least two weeks in advance**
- Provide Transportation's approved ad copy to newspaper(s)
- Provide Communications with a tear sheet (or photocopy of ad) from newspaper(s)

Correspondence to Landowners

Using the template provided, the consultant will draft correspondence to the land-owner and stakeholders in plain language.

Correspondence to include:

- an explanation that the consultant was hired by Transportation to manage the project
- a plain language description of the project
- mention that the open house(s) will take place and list the location, date and time
- mention that their participation is important and valued
- a request to landowners to advise anyone else who has an interest in this project about the open house
- a contact name and telephone number

Approval: Draft correspondence must be submitted to Communications for approval at least two weeks in advance.

Fact Sheet

The consultant will develop a fact sheet for distribution at the open house.

Information should:

- be in plain language
- provide background details
- provide current status
- state proposed plans
- provide a contact name for further information
- have both the consultant's and Transportation's logo on bottom right hand side of fact sheet

Approval: Submit draft fact sheet to Communications for approval at least two weeks in advance of open house

Display

The consultant will develop a display with maps and alternate plans or proposals if applicable.

Information should:

- be in plain language
- be point form
- be in large type
- use lots of white space
- include maps if applicable
- include charts if applicable
- have consultant's and Alberta Transportation's (bottom right hand side) logos on display panel

Approval: Submit **draft display copy** to Communications for approval at least two weeks in advance

Survey

If the consultant and Alberta Transportation decide that a survey should be developed for an open house or public meeting, the consultant will:

- develop one using plain language
- encourage participation by having a statement of how important stakeholders' comments are
- at a table near the exit, provide a cardboard box or other container so that participants can return completed surveys anonymously
- give a fax number and mailing addresses where questionnaires can be returned
- state a deadline for receipt of the questionnaires
- follow up with Communications on survey results/analysis

If the stakeholder can be identified by any information on the completed questionnaire, the following statement must be added to the survey:

APPENDIX D

Personal information that you provide on this form is protected under the Freedom of Information and Protection of Privacy Act of Alberta. The personal information that is collected on this form relates directly to programs being undertaken by Alberta Transportation and will be used to reply to your questions and concerns supplied on this form. No other use will be made of this information and it will not be released without your written consent.

Approval: Submit draft survey to Communications for approval at least two weeks in advance.

Communications for those with Special Needs

Consultants should be aware of any special needs of their stakeholders and anticipate the need for alternative formats for communications such as larger print handouts and interpreters. Where practical, meeting venues should be accessible to persons with disabilities. This would include wheelchair access, washroom access, and adequate lighting.

Issues Management

The consultant is to identify any potential issues and must advise the Alberta Transportation project manager and Communications of these. The consultant and Communications will work together to manage all issues.

Media Relations

The consultant will deal with the media on general project questions.

The consultant will:

- always respond in a timely manner
- stick to the facts
- not give their own opinion
- not comment on policy decisions
- speak only on behalf of Alberta Transportation
- not speculate if they do not know the answer to a question (advise the reporter you will get the information and call them back)
- telephone Communications and discuss media questions and responses if known ahead of time
- complete a media request form and fax immediately to Communications at 466-3166

OPEN HOUSE _____

Highway XXX - Functional Planning Study

ZZZ Engineering Ltd. has been retained by Alberta Transportation to conduct ---- etc. You are invited to attend an open house to learn more about this project.

Location:

Date:

Time:

For more information, please contact ZZZ at:

Tel:

Fax:

(company logo)



Sample Correspondence to Stakeholder

Date

Dear Property Owner:

Alberta Transportation has retained the XYZ Company, an engineering firm, to determine (description of what company XYZ is doing).

Please plan to attend the scheduled open house/public information session as your participation in this process is important.

Location:

Date:

Time:

We have attempted to contact all landowners who may be affected by this project. Should you be aware of other individuals or groups who may have an interest in this subject, please advise them of the open house/public information session or contact us directly.

If you have any questions, or would like more information, please call my office at (area code) xxx-xxxx. (Please include a toll-free number if you have one.) We look forward to seeing you at the open house/public information session.

Sincerely,

John Smith
Consultant

Sample Survey

Topic: Highway 14X Access Relocation

In order to understand your transportation requirements, concerns, and community-related issues, your assistance, by completing this survey, is appreciated.

Please take this time to review and discuss the plans with staff before completing the survey.

1. *How did you hear about this session?*

2. Were the information displays helpful? Yes No

3. Were the hosts helpful in explaining the xx? Yes No

4. *Did the open house help you to better understand the requirements for xxxxxxxxxx?*
 Yes No

5. *Do you have any comments or suggestions that you feel may be useful in the xxxxx?*

Thank-you for your participation.

Please deposit your questionnaire in the box at the door when leaving. You may also fax or mail the completed survey to: consultant's name, address, etc., fax number.

DEADLINE date (one week from time of open house)

Note: If you ask for the following information as part of the survey you must include the statement pertaining to Freedom of Information and Protection of Privacy Act.

APPENDIX D

Contact Information:

Name

Street/Avenue/RR#/Box #

Town/City

Province

Postal Code

Personal information that you provide on this form is protected under the Freedom of Information and Protection of Privacy Act of Alberta. The personal information that is collected on this form relates directly to programs being undertaken by Alberta Transportation and will be used to reply to your questions and concerns supplied on this form. No other use will be made of this information and it will not be released without your written consent.

Consultant Logo

Transportation Logo

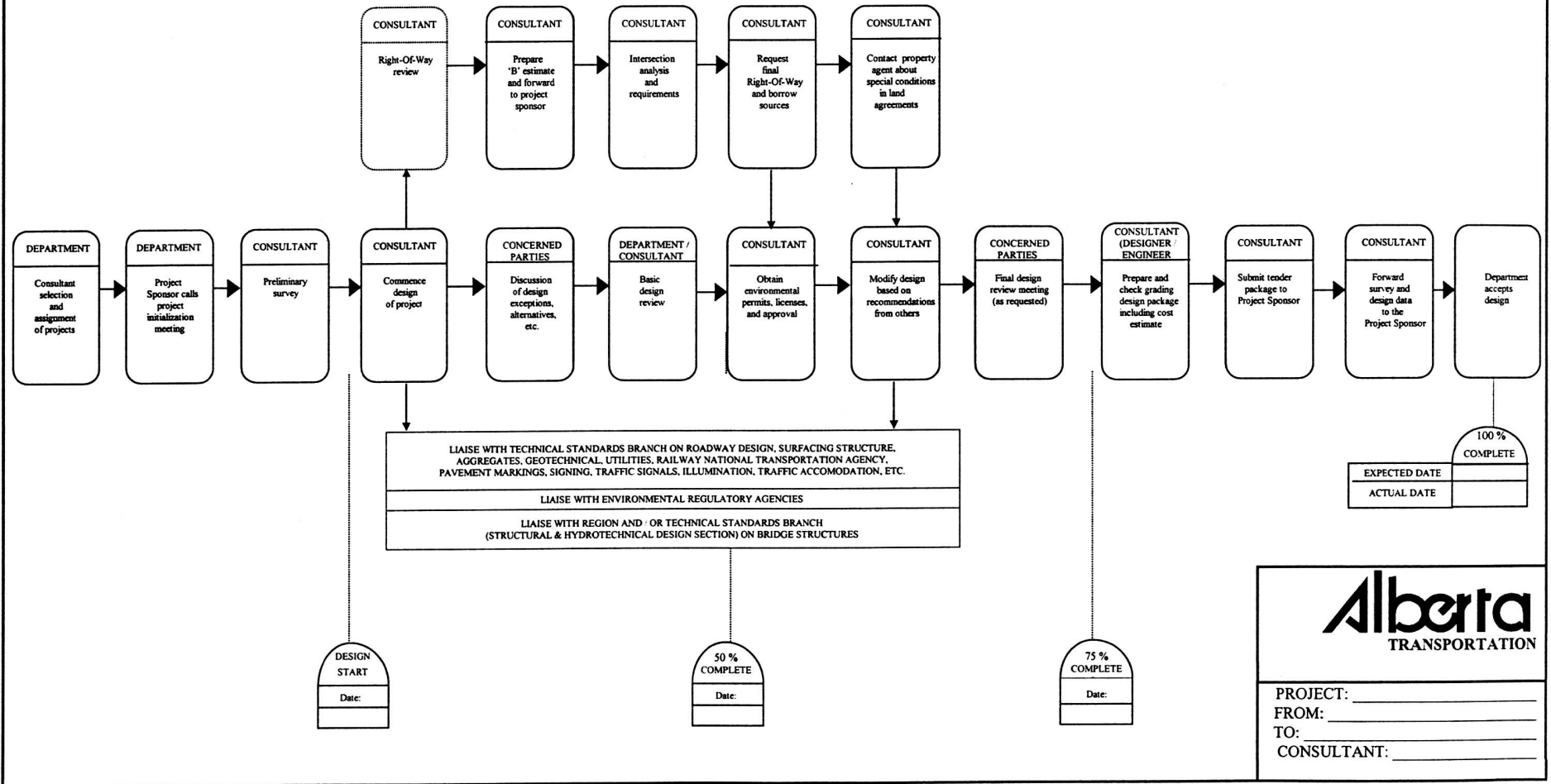
APPENDIX “E”

HIGHWAY GRADING/SURFACING DESIGN COORDINATION FLOW CHART

APPENDIX E

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CONSULTANT HIGHWAY GRADING / SURFACING DESIGN COORDINATION FLOW DIAGRAM
 THIS CHART IS ONLY A GENERAL GUIDE AS PROJECTS WILL HAVE UNIQUE DIFFERENCES THAT THE DESIGNER SHOULD ADJUST FOR



APPENDIX E

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APPENDIX “F”

SURFACING CRITERIA

APPENDIX F

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SURFACING DESIGN ESTIMATE

PREAMBLE

A. WORK SHEET

The work sheet shall contain complete project descriptions and limits for all of the work proposed, and a work-up of the spread rates and application rates per km for each typical section, for each type and layer of material. Extra material required for levelling and minor intersections or approaches are indicated here. These rates are used in the calculation of quantities in the project estimates. This is also a valuable aid to the Consultant's Representative in terms of material distribution management. Major intersection and roadside turnout quantities shall be calculated separately.

B. SCHEMATIC DIAGRAM

Prepare a graphic logistic layout of all of the major contract work components. It shows the limits of work segments and project limits for each project, expressed in kilometres. Show locations of all of the typical sections and respective limits where they occur. Special notes and details or conditions regarding bridges, curb and gutter, railway crossings, intersections, climbing lanes, and other special peculiarities are also shown here.

C. TYPICAL SECTIONS AND DETAILS

Show all of the typical sections. Each typical section shows the layers and thicknesses expressed in mm, widths expressed in m, as well as the type, class and designation of material to be used in the construction of each layer and requirements of each tack coat. It also indicates the requirements of spray coats where required. Crossfall and sideslope gradients should be shown when necessary.

D. PROJECT ESTIMATES

Each project in the contract requires a separate complete comprehensive estimate of quantities and costs. Each estimate shall include the contract costs, contingency and engineering.

E. BID ITEM SUMMARY

Prepare a summary of the total quantities from all of the project estimates for all of the bid items in the contract.

F. COST SUMMARY

Prepare a summary of all of the total costs from all of the projects for all of the bid items as well as the total estimated costs including contract costs, contingencies and engineering.

G. SURFACING ESTIMATE SUMMARY

Compile a combined summary of quantities and costs used in the preparation of the "Unit Price Schedule" for the final tender documents.

H. CONTRACT LOCATION MAP (KEY PLAN)

Prepare a map of the geographic location of the contract.

I. MATERIALS DISTRIBUTION SUMMARY

Prepare a distribution chart for the major haul related materials.

SPREAD RATE GUIDELINES FOR FIRST COURSE GRAVEL SURFACING DESIGN

The following chart has been developed to assist in the design of first course gravel surfacing quantities:

SUBGRADE WIDTH (m)	SPREAD RATE (m³/km)
7.0	300
8.0	350
9.0	400
10.0	450
11.0	500
12.0	550
13.0	600
14.0	650
15.0	700
16.0	750
17.0	800
18.0	850

The spread rates provided apply to general application only. The condition of the subgrade may affect the actual gravel requirements.

Alberta Transportation
Technical Standards Branch
Highway Engineering Section

Guidelines for Selecting Type of Seal Coat on a Paved Surface

Once a project has been selected and approved for seal coat application on a paved surface the traffic volume determines the seal coat type and aggregate materials as shown in the following table:

Traffic Volume A.A.D.T.	Seal Coat Type	Specification for Aggregate (see Specification 3.2 Table 3.2.3.1)	
		Designation	Class
> 10,000	Chip Seal	3	12.5 AW
500 – 10,000	Chip Seal	3	12.5 BW
< 500	Graded Aggregate Seal	3	12.5 C

<p>ALBERTA TRANSPORTATION Technical Standards Branch</p>	<p>Date: Mar/06/95</p> <p>File: Hwy. 41:08 S.H. 545:02 A.R 154 Designed by: D.C. Reviewed by: V.G.</p>	
<p>SURFACING ESTIMATE WORKSHEET</p>		
<p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p>“ Contractor’s Supply With Option “</p>		
<p>HWY. xx:xx S.H xxx:xx A.R. xxx</p>	<p>From Jct. Hwy xx:xx to N. of Hwy xx:xx From Jct. Hwy xx:xx to N. of Hwy xx:xx From Jct. Hwy xx:xx to N. of Hwy xx:xx</p>	<p>km 21.850 - km 39.229 = 17.379 km km 0.000 - km 6.511 = 6.511 km km 0.000 - km 5.124 = 5.124 km</p>
<p>SUBGRADE EXCAVATION</p> <p>HAUL OF SUBGRADE EXCAVATION</p> <p>GRANULAR FILL</p> <p style="padding-left: 20px;">Backfill: Pit - Run Des. 6 Class 125</p> <p style="padding-left: 20px;">Backfill: Crushed Des. 2 Class 25</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix type 4</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Minor Ints.</p> <p style="padding-left: 40px;">Extras</p> <p style="padding-left: 40px;">Total (t/km)</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix type 6</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Minor Ints.</p> <p style="padding-left: 40px;">Extras</p> <p style="padding-left: 40px;">Total (t/km)</p> <p>ASPHALT CONCRETE PAVEMENT - EPS</p> <p style="padding-left: 20px;">Mix type 8</p> <p style="padding-left: 40px;">Roadway</p> <p style="padding-left: 40px;">Minor Ints.</p> <p style="padding-left: 40px;">Extras</p> <p style="padding-left: 40px;">Total (t/km)</p> <p>SCHEDULE, NOTE OR SPECIAL PROVISIONS</p> <p>SEE ATTACHED</p>	<p>500 m³ Total</p> <p>2.0 km</p> <p>650 t Total</p> <p>650 t Total</p> <p><u>Typ. 'A'</u></p> <p>1,300</p> <p>50</p> <p>50</p> <p><u>1,400</u></p> <p><u>Typ. 'B'</u> <u>Typ. 'C'</u></p> <p>1,650 850</p> <p>100 50</p> <p>200 150</p> <p><u>1,950</u> <u>1,050</u></p> <p><u>Typ. 'A'</u></p> <p>550</p> <p>50</p> <p>150</p> <p><u>750</u></p>	

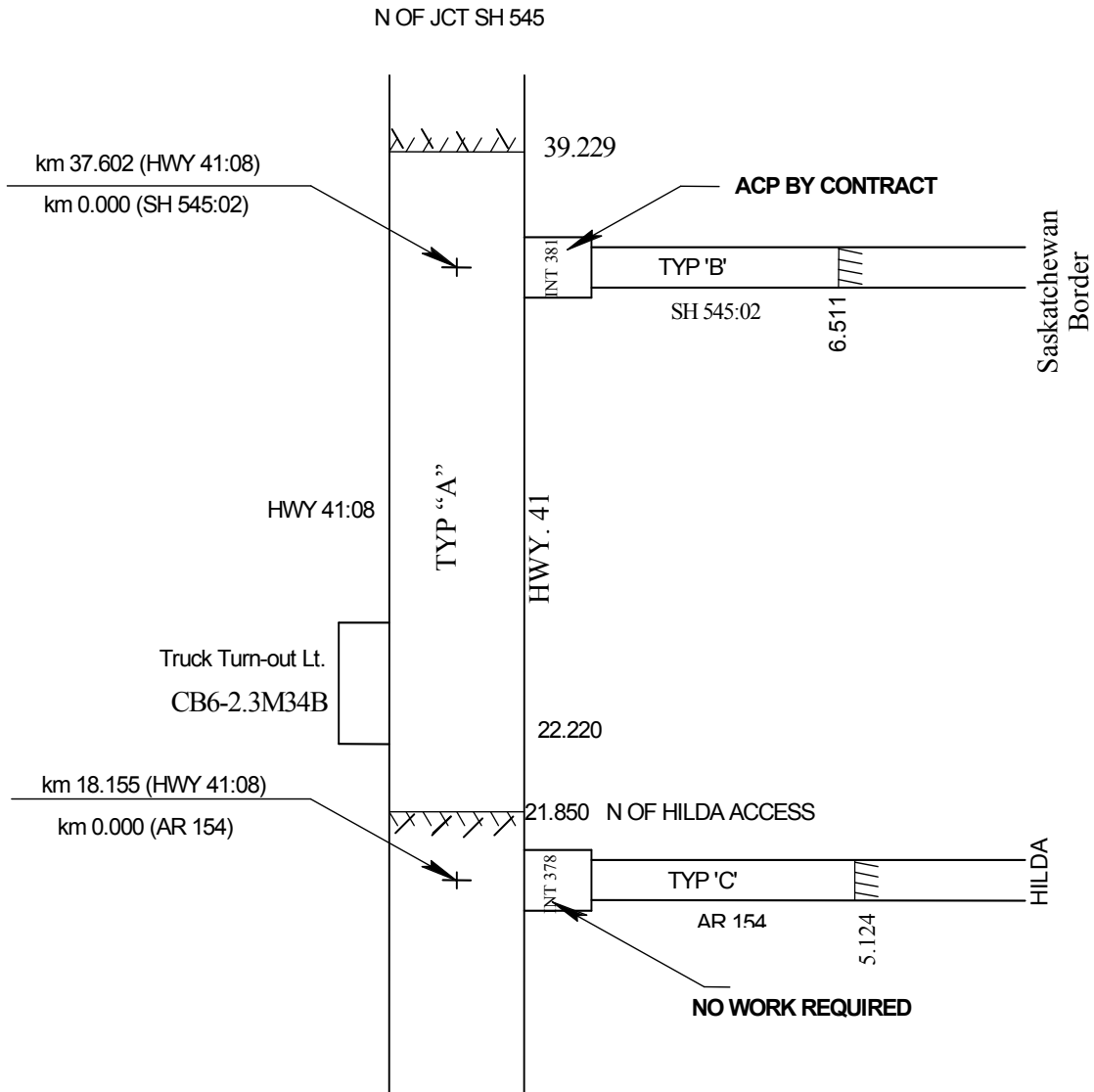
ALBERTA
TRANSPORTATION
Technical Standards Br.

Date: Feb./17/95

SURFACING ESTIMATE SCHEMATICS

File: Hwy. 41:08
 S.H. 54:02
 A.R 154
 Designed by: D. C.
 Reviewed by: V. G.

SCHEMATIC



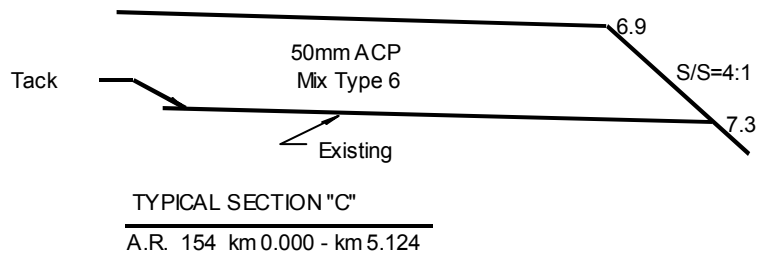
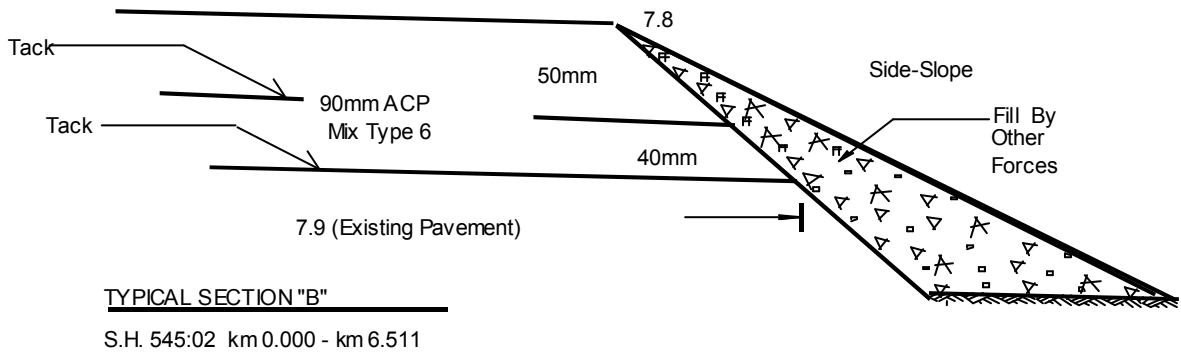
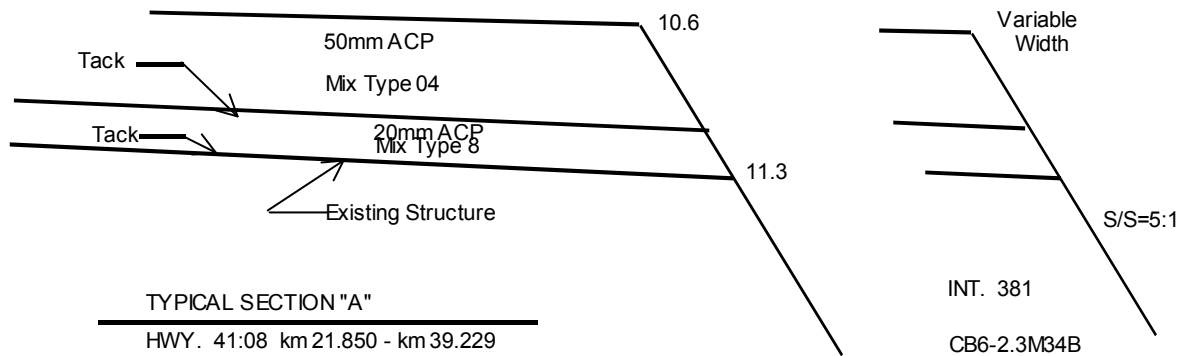
ALBERTA
TRANSPORTATION
Technical Standards Br.

Date: Mar./03/95

SURFACING ESTIMATE TYPICALS

File: Hwy.41:08
 S.H. 545:02:xx
 A.R 154
 Designed by: D. C.
 Reviewed by: V. G.

TYPICALS



APPENDIX F

ALBERTA TRANSPORTATION Technical Standards Br. SURFACING ESTIMATE	Date: 03 - March - 95
	File: Hwy.41:08
	Designed by: D. C.
	Reviewed by: V. G.

ASPHALT CONCRETE PAVEMENT - EPS

“ Contractor’s Supply With Option “

PROJECT: Hwy 41:08
 LOCATION N. of Hilda Access - N. of Jct S.H. 545
 km 21.850 - km 39.229 = 17.379 km

SUBGRADE EXCAVATION allow 400 m³
 Subgrade Excavation : 400 m³ X 3.50 \$/m³ = \$1,400

HAUL OF SUBGRADE EXCAVATION MATERIAL Basic Loading Factor : 400 m³ X 1.20 \$/m³ = \$480
 Haul @ 2.00 km : 800 m³km X 0.20 \$/m³km = \$160

GRANULAR FILL #6 - 125 (Inc. 3, 4, 5) Backfill : 200 m³ X 2.33 t/m³= $\frac{470 \text{ t}}{470 \text{ t}}$
 Granular Fill # 6 -125 (Inc. 3, 4, 5) : 500 t X 7.00 \$/t = \$3,500

GRANULAR FILL #2 - 25 (Inc. 3, 4, 5) Backfill : 200 m³ X 2.33 t/m³= $\frac{470 \text{ t}}{470 \text{ t}}$
 Granular Fill #2 - 25 (Inc. 3, 4, 5) : 500 t X 9.00 \$/t = \$4,500

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type 4 (Inc. 1, 3, 4, 5)

‘A’ km 21.850 to km 39.229 = 17.379 km X 1,400 t/km = 25,330 t
 CB6-2.3M34B :
 [1600 m² + (350 m X 0.125 m)] X 0.050 m X 2.33 t/m³ + 10% = 210 t
 Int. 381 :
 [2200 m² + (500 m X 0.125 m)] X 0.050 m X 2.33 t/m³ + 10% = $\frac{290 \text{ t}}{24,830 \text{ t}}$

Asphalt Concrete Pavement - E.P.S. Mix Type 4 (Inc. 1, 3, 4, 5) : 24,900 t X 23.00 \$/t = -----\$572,700

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type 8 (Inc. 1, 3, 4, 5)

‘A’ km 21.850 to km 39.229 = 17.379 km X 7.50 t/km = 13,040 t
 CB6-2.3M34B :
 [1600 m² + (350 m X 0.300 m)] X 0.020 m X 2.33 t/m³ + 10% = 90 t
 Int. 381 :
 [2200 m² + (500 m X 0.300 m)] X 0.020 m X 2.33 t/m³ + 10% = $\frac{120 \text{ t}}{13,250 \text{ t}}$

Asphalt Concrete Pavement - E.P.S. Mix Type 8 (Inc. 1, 3, 4, 5) : 13,300 t X 25.00 \$/t = -----\$332,500

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge

'A' km 21.850 to km 39.229 = $\frac{17.379 \text{ km}}{17.379 \text{ km}}$

Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge : 17.38 km X 325.00 \$/km = -----\$5,648

ROADWAY LINES - Supplying Paint & Painting Lane Dividing Lines – Turnout

km 22.060 to km 22.380 = $\frac{0.320 \text{ km}}{0.320 \text{ km}}$

Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout : 0.32 km X 150.00 \$/km =-----\$48

INTERSECTION LINES - Supplying Paint & Painting All Lines

Int # 381

Intersection Lines – Supplying Paint & Painting All Lines : 1 unit X 125.00 \$/unit =----- \$125

SUPPLY OF AGGREGATE - WITH OPTION

Granular Fill : 1,000 t

ACP : $\frac{38,200 \text{ t}}{39,200 \text{ t}}$

TOTAL : 39,200 t

Supply of Aggregate - With Option : 39,200 t X 1.00 \$/t = ----- \$39,200

MOBILIZATION

10.00 % MOBILIZATION	<u>\$96,030</u>
TOTAL	\$1,056,291
CONTRACT	\$1,060,000
+ 10 %	<u>\$106,000</u>
CONTRACT + 10 %	\$1,166,000
ENGINEERING	<u>\$74,000</u>
TOTAL ESTIMATED COST	\$1,240,000

ALBERTA TRANSPORTATION Technical Standards Br.	Date: 30 - Feb. - 95
SURFACING ESTIMATE	File: S.H. 545:02 Designed by: D.C. Reviewed by: V.G.

ASPHALT CONCRETE PAVEMENT – EPS

“ Contractor’s Supply With Option “

PROJECT: S.H. xxx:xx
LOCATION: From Jct. Hwy xx:xx to N. of Hwy xx:xx
 km 0.000 - km 6.511 = 6.511

SUBGRADE EXCAVATION	allow 100 m ³	
	Subgrade Excavation : 100 m ³ X 3.50 \$/m ³ =	\$350
HAUL OF SUBGRADE EXCAVATION MATERIAL	Basic Loading Factor : 100 m ³ X 1.20 \$/m ³ =	\$120
	Haul @ 2.00 km : 200 m ³ km X 0.20 \$/m ³ km =	\$40
GRANULAR FILL #6 - 125 (Inc. 3, 4, 5)	Backfill : 50 m ³ X 2.33 t/m ³ = $\frac{120 \text{ t}}{120 \text{ t}}$	
	Gran. Fill # 6 -125 (Inc.3, 4, 5) : 150 t X 7.00 \$/t =	\$1,050
GRANULAR FILL #2 - 25 (Inc. 3, 4, 5)	Backfill : 50 m ³ X 2.33 t/m ³ = $\frac{120 \text{ t}}{120 \text{ t}}$	
	Gran. Fill #2 - 25 (Inc. 3, 4, 5) : 150 t X 9.00 \$/t =	\$1,350

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type 6 (Inc. 1, 3, 4, 5)
 ‘B’ km 0.000 to km 6.511 = 6.511 X 1,950 t/km = $\frac{12,700 \text{ t}}{12,700 \text{ t}}$
 Asphalt Concrete Pavement - E.P.S. Mix Type 6 (Inc. 1, 3, 4, 5) : 12,700 t X 25.00 \$/t = -----\$317,500

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge
 ‘B’ km 0.000 to km 6.511 = $\frac{6.511 \text{ km}}{6.511 \text{ km}}$
 Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge 6.51 km X 325.00 \$/km = \$2,116

SUPPLY OF AGGREGATE - WITH OPTION
 Granular Fill : 300 t
 ACP : $\frac{12,700 \text{ t}}{13,000 \text{ t}}$
 TOTAL : 13,000 t
 Supply of Aggregate - With Option : 13,000 t X 1.00 \$/t = ----- \$13,000

MOBILIZATION	10.00 % MOBILIZATION	<u>\$33,560</u>
	TOTAL	<u>\$369,086</u>

CONTRACT	\$370,000
+ 10 %	<u>\$37,000</u>
CONTRACT + 10 %	\$407,000
ENGINEERING	<u>\$33,000</u>
TOTAL	
ESTIMATED COST	\$440,000

ALBERTA TRANSPORTATION Technical Standards Br.	Date: 03 – March - 95
SURFACING ESTIMATE	File: AR 154
	Designed by: D.C. Reviewed by: V.G.

ASPHALT CONCRETE PAVEMENT – EPS

“ Contractor’s Supply With Option “

PROJECT: A.R. 154
LOCATION: From Jct. Hwy xx:xx to N. of Hwy xx:xx
 km 0.000 - km 5.124 = 5.124 km

ASPHALT CONCRETE PAVEMENT End Product Spec. Mix Type 4 (Inc. 1, 3, 4, 5)

‘C’ km 0.000 to km 5.124 = 5.124 km X 1,050 t/km = $\frac{5,380 \text{ t}}{5,380 \text{ t}}$
 Asphalt Concrete Pavement - E.P.S. Mix Type 4 (Inc. 1, 3, 4, 5) : 5,400 t X 25.00 \$/t = ----- \$135,000

ROADWAY LINES - Supplying Paint & Painting Directional Dividing + 2 Edge

‘C’ km 0.030 to km 5.124 = $\frac{5.09 \text{ km}}{5.09 \text{ km}}$
 Roadway Lines – Supplying Paint & Painting Directional Dividing + 2 Edge:
 5.09 km X 325.00 \$/km = ----- \$1,654

SUPPLY OF AGGREGATE - WITH OPTION

ACP : $\frac{5,400 \text{ t}}{5,400 \text{ t}}$
 TOTAL : 5,400 t
 Supply of Aggregate - With Option : 5,400 t X 1.00 \$/t = ----- \$5,400

MOBILIZATION	10.00 % MOBILIZATION	<u>\$14,210</u>
	TOTAL	\$156,264
	CONTRACT	\$160,000
	+ 10 %	<u>\$16,000</u>
	CONTRACT + 10 %	\$176,000
	ENGINEERING	<u>\$14,000</u>
	TOTAL	
	ESTIMATED COST	\$190,000

ALBERTA
TRANSPORTATION

Technical Standards Br.

Date: xx/xx/xx

SURFACING ESTIMATE SUMMARY

File: H41:08, SH 545:02

AR 154

Designed by: D. C.

Reviewed by: V.G.

BID ITEM SUMMARY

DESCRIPTION	Hwy 41:08	S.H. 545:02	AR. 154	TOTAL	UNITS
Mobilization	\$96,030	\$33,560	\$14,210	\$143,800	lump \$
Supply of Aggregate - With Option	39,200	13,000	5,400	57,600	t
Subgrade Excavation	400	100		500	m ³
Haul of Subgrade Exc. Mat. B.L.F.	400	100		500	m ³
Haul	800	200		1000	m ³ km
Granular Fill #6 - 125 (Inc. 3, 4, 5)	500	150		650	t
Granular Fill #2 -25 (Inc. 3, 4, 5)	500	150		650	t
Asphalt Concrete Pavement - E.P.S. Mix Type 6 (Inc. 1, 3, 4, 5)		12,700	5,400	18,100	t
Asphalt Concrete Pavement - E.P.S. Mix Type 4 (Inc. 1, 3, 4, 5)	24,900			24,900	t
Asphalt Concrete Pavement - E.P.S. Mix Type 8 (Inc. 1, 3, 4, 5)	13,300			13,300	t
Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge	17.38	6.51	5.09	28.98	km
Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout	.32			.32	km
Intersection Lines - Supplying Paint & Painting All Lines	1.0			1.0	km

MATERIAL SUMMARY

DESCRIPTION	Hwy. 41:08	S.H. 545:02	A.R. 154	TOTAL	UNITS
-------------	------------	-------------	----------	-------	-------

UNIT PRICE AND EXTENSION TO BE INSERTED INTO THE
UNIT PRICE SCHEDULE BY CONTRACTS & COMPLIANCE BRANCH
i.e. 57,600t @ \$1.00/t = \$57,600

APPENDIX F**ALBERTA
TRANSPORTATION****Technical Standards Br.****SURFACING ESTIMATE SUMMARY**

Date: 03 – March - 95

File: Hwy. 41:08, SH 545:02

A.R. 154

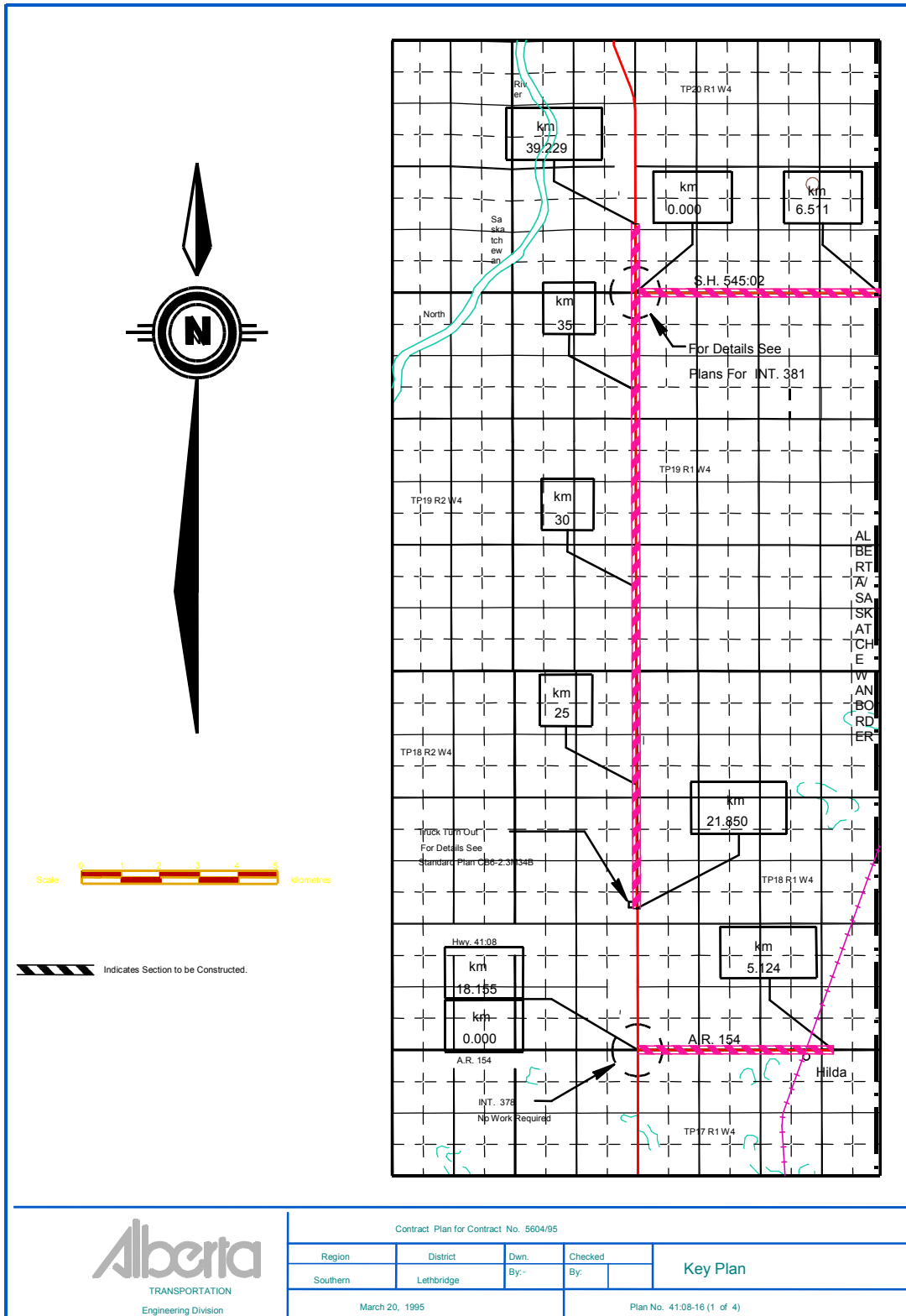
Designed by: D. C.

Reviewed by: V. G.

COST SUMMARY

DESCRIPTION	Hwy. 41:08	S.H. 545:02	AR. 154	TOTAL
Mobilization	\$96,030	\$33,560	\$14,210	\$143,800
Supply of Aggregate - With Option	\$39,200	\$13,000	\$5,400	\$57,600
Subgrade Excavation	\$1,400	\$350		\$1,750
Haul of Subgrade Exc. Mat. B.L.F.	\$480	\$120		\$600
Haul	\$160	\$40		\$200
Granular Fill #6 - 125 (Inc. 3, 4, 5)	\$3,500	\$1,050		\$4,550
Granular Fill #2 -25 (Inc. 3, 4, 5)	\$4,500	\$1,350		\$5,850
Asphalt Concrete Pavement - E.P.S. Mix Type 6 (Inc. 1, 3, 4, 5)		\$317,500	\$135,000	\$454,500
Asphalt Concrete Pavement - E.P.S. Mix Type 4 (Inc. 1, 3, 4, 5)	\$572,700			\$572,700
Asphalt Concrete Pavement - E.P.S. Mix Type 8 (Inc. 1, 3, 4, 5)	\$332,500			\$332,500
Roadway Lines - Supplying Paint & Painting Directional Dividing + 2 Edge	\$5,648	\$2,116	\$1,654	\$9,418
Roadway Lines - Supplying Paint & Painting Lane Dividing Lines - Turnout	\$48			\$48
Intersection Lines - Supplying Paint & Painting All Lines	\$125			\$125
TOTAL	\$1,056,291	\$396,086	\$156,264	\$1,581,641
CONTRACT	\$1,060,000	\$370,000	\$160,000	\$1,590,000
+ 10%	\$106,000	\$37,000	\$16,000	\$159,000
CONTRACT + 10%	\$1,166,000	\$407,000	\$176,000	\$1,749,000
ENGINEERING	\$74,000	\$33,000	\$14,000	\$121,000
TOTAL ESTIMATED COST	\$1,240,000	\$440,000	\$190,000	\$1,870,000

APPENDIX F



APPENDIX F

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APPENDIX “G”

SUPPLY OF AGGREGATE

APPENDIX G

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The following is a brief description of the forms and their purpose. Examples follow in the same order as listed.

AGGREGATE DATA SUMMARY REQUEST

Use this form to formally request an aggregate source for all projects. It will be returned with the information necessary to complete the special provisions for the contract. This new form replaces both the Aggregate Data Summary (MT-2-12/90) and Aggregate Source Data Sheet (MAT2-11/90).

PIT PLAN

Use this plan to show the proposed pit operations such as areas to be cleared and mined, stockpile and plant sites, areas to be backfilled or reclaimed. It may not be necessary to repeat in the special provisions what is clearly shown on the plan. The plan may require a draft update prior to including it in the tender document.

AGGREGATE TESTING PLAN

This plan shows the testholes, open pit and other surface features. The proposed pit operations should NOT be shown here. An additional plan, sufficiently enlarged to ensure the text is legible, shall be included for the portion of the plan where mining is to occur.

The plan may require updating before it can be included in the tender document.

SIEVE ANALYSIS

These correspond to the test holes on the Aggregate Testing Plan. These sheets will be included in the tender documents.

AGGREGATES DATA SUMMARY REQUEST

PROJECT (To be completed by the Consultant) (Nominal Length _____ km)

1. _____, km _____ to km _____. (FR: _____ - TO: _____)

COMBINED WITH

2. _____, km _____ to km _____. (FR: _____ - TO: _____)

3. _____, km _____ to km _____. (FR: _____ - TO: _____)

MATERIALS REQUIRED

PREDOMINANT TYPE OF WORK	MATERIAL TYPE DES-CLASS	GRAVEL QUANTITY (M3)	DATE REQUESTED:	CONTACT NAME: E-MAIL:
ACP				COMPANY:
GBC			DATE REQUIRED:	ADDRESS:
				CITY:
			ADVERTISING DATE:	FAX: ()
TOTAL				PHONE: ()

AGGREGATE SOURCES AVAILABLE (to be completed by AT (Aggregates Co-ordinator). Copy to Highway Engineering Section)

_____ **CONTRACTOR SUPPLY (WITH OPTION)**

_____ **CONTRACTOR SUPPLY (NO OPTION)**

TYPE	NAME	LOCATION	OWNERSHIP	QUANTITY (M3)	AGG.VALUE.
					\$ /t
					\$ /t
					\$ /t

MINIMUM SPECIAL CONDITIONS REQUIREMENTS

Related Pit

Above

- _____ Bull Crusher
- _____ Mining Below Water
- _____ Haul Road Construction _____ / _____ m
- _____ Fencing Down or/Take Down and Reinstall _____ m
- _____ Cattle Guard
- _____ Co-ordination with Other Forces
- _____ Clearing and Disposal of Timber _____ ha
- _____ Clearing and Salvage of Timber _____ ha
- _____ Reclamation _____ ha
- _____ Excessive Sand or Clay

ADDITIONAL INFORMATION ATTACHED

Related Pit

Above

- _____ WRITTEN PROVISIONS
- _____ PIT PLAN
- _____ TESTING PLAN
- _____ OWNERSHIP (AGREEMENT RESERVATION, ETC.)
- _____ ENVIRONMENT APPROVAL
- _____ LAB RESULTS

APPROVAL

(Name)

Aggregates Co-ordinator
(Title)

(Date Issued)

PIT PLAN

REQUIRED PROCEDURE FOR OPERATIONS IN THE _____ BLACKFALDS _____ PIT

NE 22 22
SE 1/4 SEC. 22 TP. 39 RGE. 27 W. 4 M.



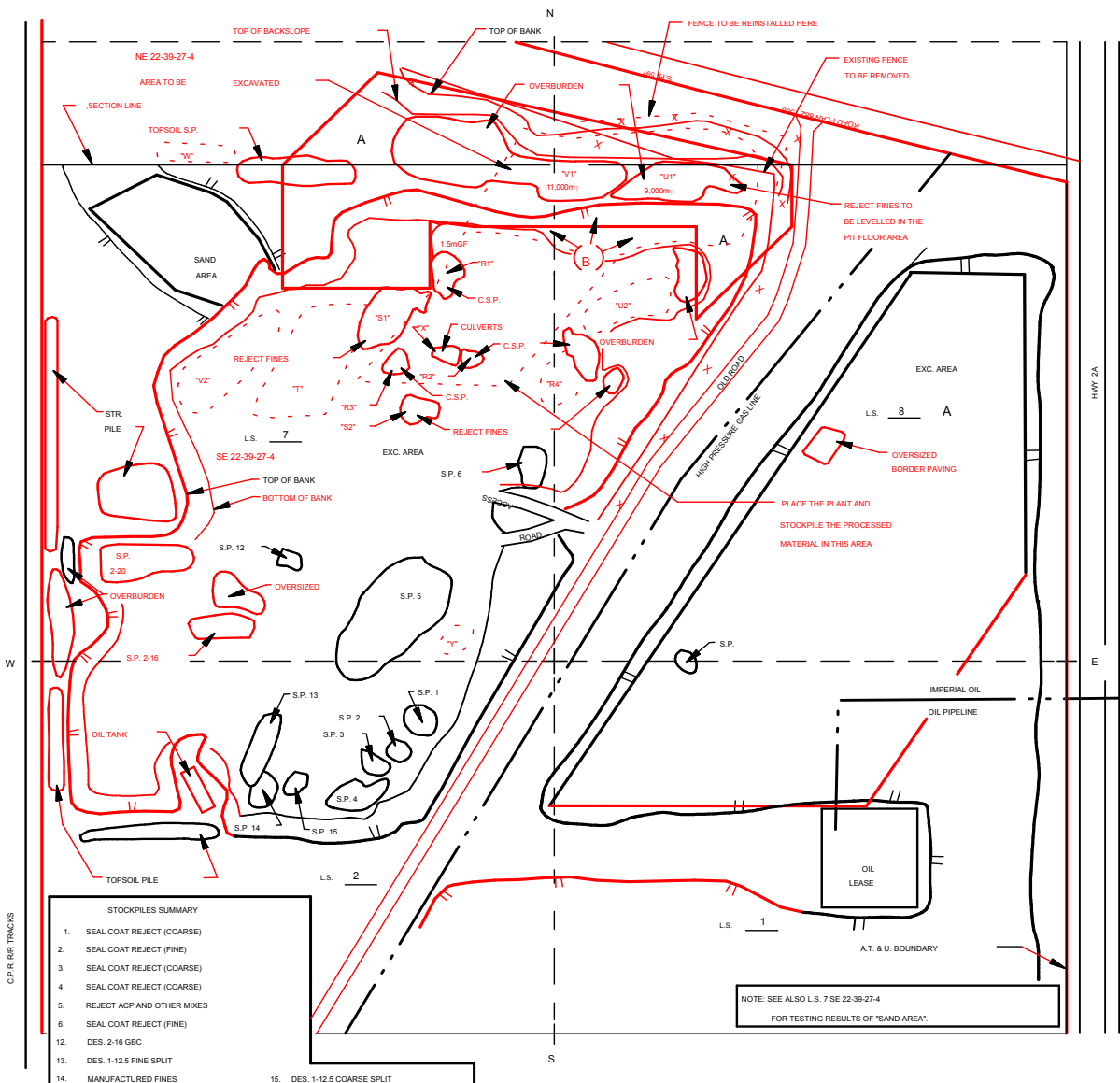
NOTE:

- BEGIN AGGREGATE EXCAVATION IN AREA
- BEGIN AGGREGATE EXCAVATION IN AREA
- PLACE OVERBURDEN IN AREA "Y" OUTLINED WITH A DASHED LINE
- PLACE OVERBURDEN IN AREA DESIGNATED BY THE ENGINEER
- PLACE REJECT OR UNSUITABLE MATERIAL IN AREA DESIGNATED BY THE ENGINEER

"X" OUTLINED WITH A DASHED LINE DESIGNATED BY THE ENGINEER WITH A DASHED LINE WITH A DASHED LINE THE ENGINEER

LEGEND:

- OP OPEN PIT
- A AGGREGATE AREA
- D DEPLETED AREA
- STR STRIPPING
- T TOPSOIL
- GF GRAVEL FACE
- SF SAND FACE
- SP. STOOPPILE
- C.S.P. CRUSH STOOPPILE
- A.T. RESV. BDY. BOUNDARY OF RESERVATION AREA
- A.T. AGR. BDY. BOUNDARY OF AGREEMENT AREA
- HWY. R.W. HIGHWAY RIGHT OF WAY
- X- FENCE LINE
- MUSKIEG



STOCKPILES SUMMARY

1. SEAL COAT REJECT (COARSE)
2. SEAL COAT REJECT (FINE)
3. SEAL COAT REJECT (COARSE)
4. SEAL COAT REJECT (COARSE)
5. REJECT ACP AND OTHER MIXES
6. SEAL COAT REJECT (FINE)
12. DES. 2-16 GBC
13. DES. 1-12.5 FINE SPLIT
14. MANUFACTURED FINES
15. DES. 1-12.5 COARSE SPLIT

NOTE: SEE ALSO L.S. 7 SE 22-39-27-4 FOR TESTING RESULTS OF "SAND AREA".

DATE _____ 19 _____

FOR ROADWAY ENGINEERING BRANCH

AGGREGATE TESTING PLAN

LOCATION SW SEC. 25 TP. 42 RGE. 26 W. 4 M.

NAME PONOKA

TESTED BY WRIGHT DATE FEB. 19 82

BY PAAP/CEASER DATE OCT. 19 98

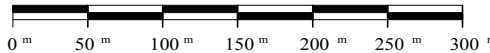
AMENDMENTS:

DATE	INITIALS	NATURE
15/03/82	S.A.	DRAWN
17/08/87	R.H.	UPDATED
18/12/89	R.H.	UPDATED
24/02/93	G.B.K.	UPDATED
08/03/93	R.H.	EDITED



DATE	INITIALS	NATURE
07/02/94	R.H.	UPDATED
27/05/94	R.H.	RENUMBERED S.P.
23/04/96	T.N.	UPDATED
26/4/96	PAAP	UPDATE
10/11/98	PAAP/JEFH	GPS UPDATE/RETEST

AGGREGATES TESTING



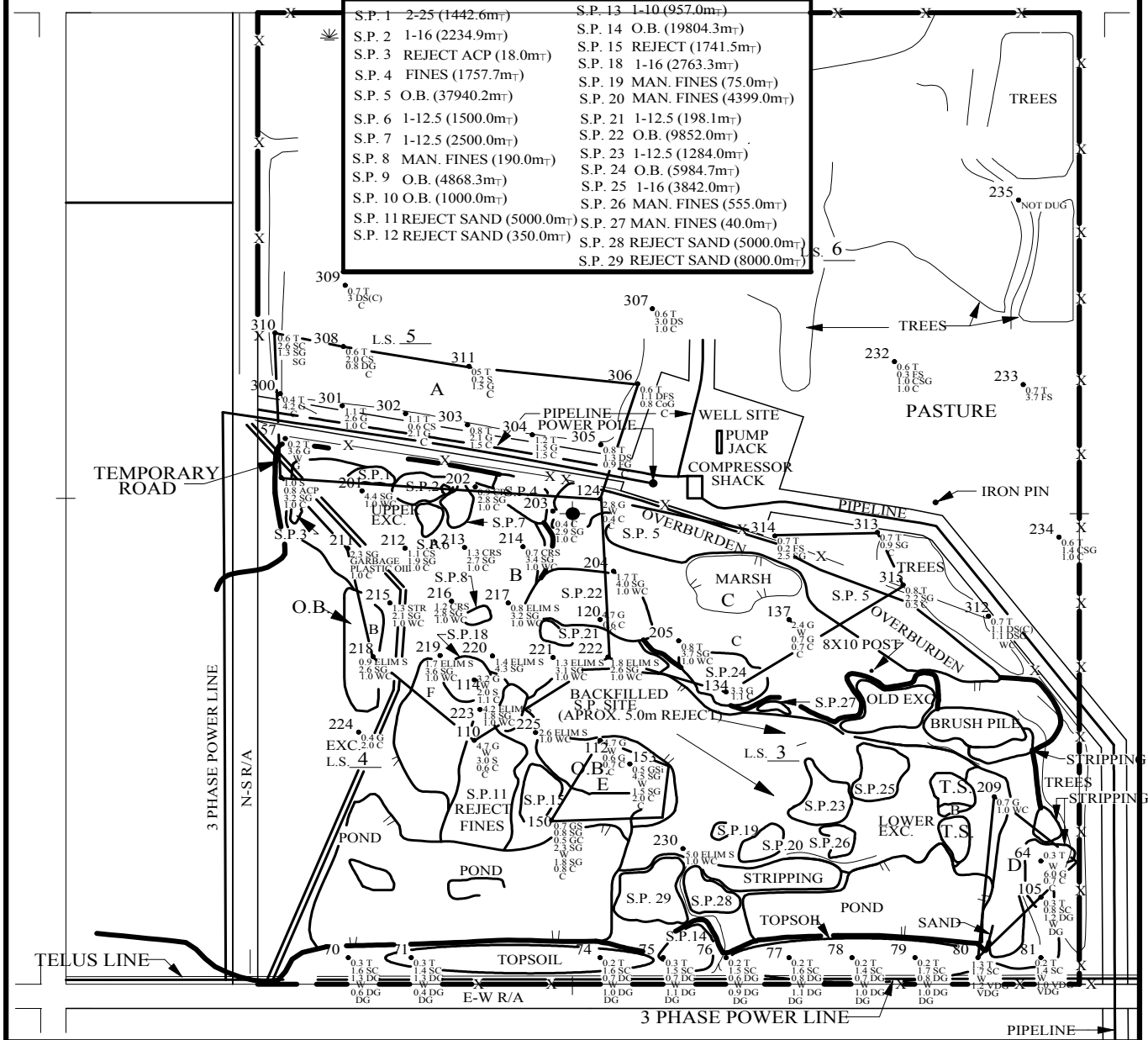
LEGEND

F FINE	Ss SANDSTONE	-X- FENCE	A.T. RESV. BDY. BOUNDARY OF RESERVATION AREA
Co COARSE	Sh SHALE	MUSKEG	A.T. AGR. BDY. BOUNDARY OF AGREEMENT AREA
D DIRTY	B&B BEDROCK	S.P. STOCKPILE	STOCKPILE HWY./R.W. HIGHWAY RIGHT OF WAY
T ORGANIC TOPSOIL	B BOULDERS	C.S.P. CRUSHED STOCKPILE	DEAD HAUL CULT. CULTIVATED AREA
C CLAY	L LAYER	STR. STRIPPING	D.H. DEAD HAUL CULT. GRAVEL FACE
Si SILT	W WATER LEVEL AT TIME OF TESTING	O.P. OPEN PIT	GF SAND FACE
S SAND	□ TEST HOLE	DEP. DEPLETED	+
G GRAVEL	Pg PEA GRAVEL	+ 2X1	

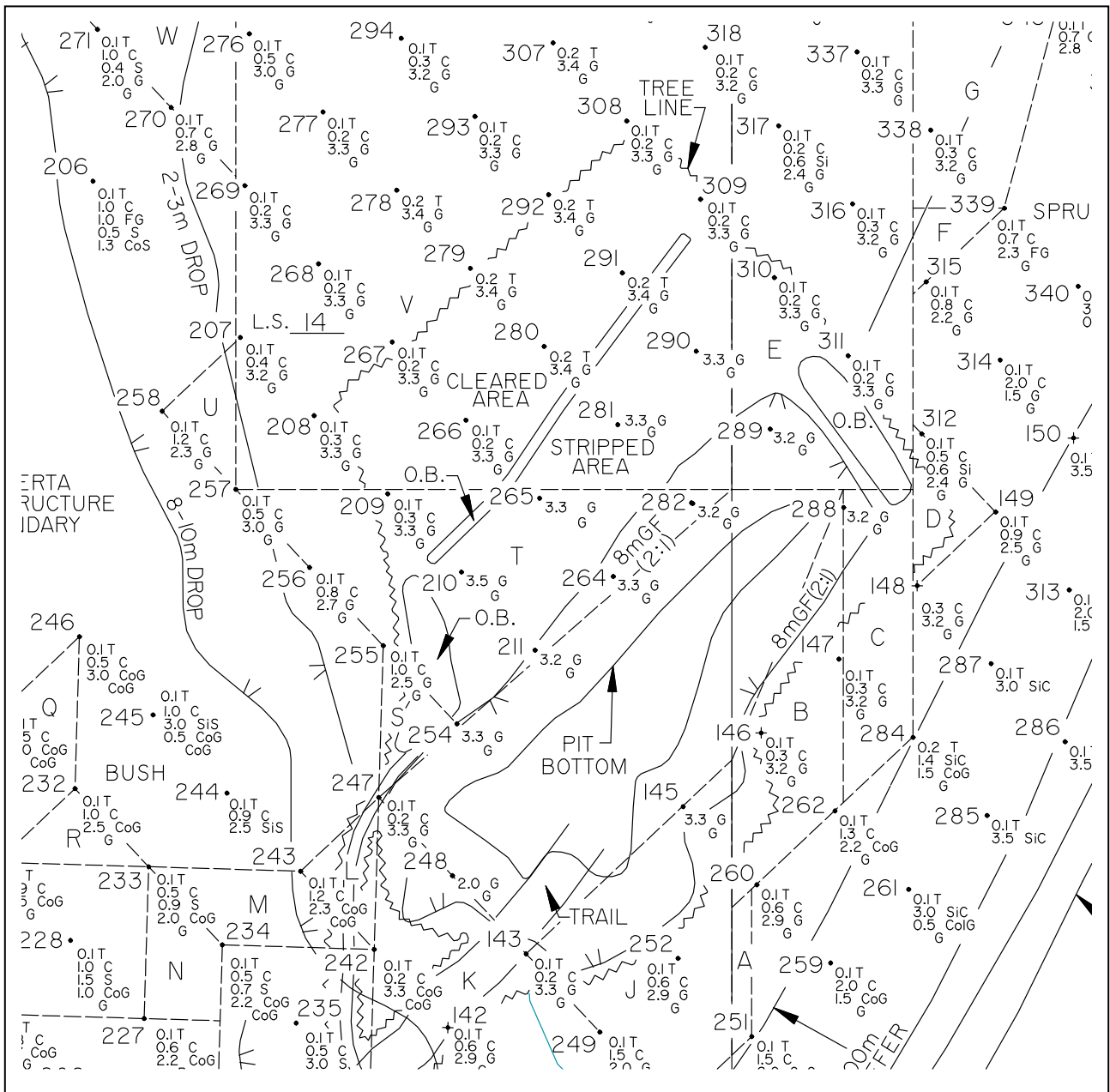
TOPOGRAPHICAL FEATURES INDICATED BY WORDS

STOCKPILE SUMMARY

S.P. 1 2-25 (1442.6m ³)	S.P. 13 1-10 (957.0m ³)
S.P. 2 1-16 (2234.9m ³)	S.P. 14 O.B. (19804.3m ³)
S.P. 3 REJECT ACP (18.0m ³)	S.P. 15 REJECT (1741.5m ³)
S.P. 4 FINES (1757.7m ³)	S.P. 18 1-16 (2763.3m ³)
S.P. 5 O.B. (37940.2m ³)	S.P. 19 MAN. FINES (75.0m ³)
S.P. 6 1-12.5 (1500.0m ³)	S.P. 20 MAN. FINES (4399.0m ³)
S.P. 7 1-12.5 (2500.0m ³)	S.P. 21 1-12.5 (198.1m ³)
S.P. 8 MAN. FINES (190.0m ³)	S.P. 22 O.B. (9852.0m ³)
S.P. 9 O.B. (4868.3m ³)	S.P. 23 1-12.5 (1284.0m ³)
S.P. 10 O.B. (1000.0m ³)	S.P. 24 O.B. (5984.7m ³)
S.P. 11 REJECT SAND (5000.0m ³)	S.P. 25 1-16 (3842.0m ³)
S.P. 12 REJECT SAND (350.0m ³)	S.P. 26 MAN. FINES (555.0m ³)
	S.P. 27 MAN. FINES (40.0m ³)
	S.P. 28 REJECT SAND (5000.0m ³)
	S.P. 29 REJECT SAND (8000.0m ³)



ENLARGED AGGREGATE TESTING PLAN (AREA TO BE MINED)



APPENDIX G

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APPENDIX “H”

UTILITY ADJUSTMENT AGREEMENTS (SAMPLES)

APPENDIX H

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This appendix contains sample agreements that have been used by Alberta Transportation (AT) to arrange for adjustments to utilities which are generally required due to highway upgrading or new construction.

A letter format is normally used for agreements with TELUS, Alberta Power and TransAlta Utilities. Sample #1, 2 and 9 should be sent under the Consultant's Company letterhead and Sample #4, 5, 6, 7 and 8 should be sent under AT letterhead. For pipelines, one of two standard "pipeline crossing agreements" is used. The first type (sample 5) is used for upgrading of existing roadways or twinning. The second type (sample 6) is used on "new construction" projects.

Samples of each type of agreement follow:

- Sample 1** Letter of Notification
- Sample 2** Letter Requesting Cost Estimate
- Sample 3** Letter of Confirmation of Cost Estimate and Signing Agreements (Utility Company)
- Sample 4** Letter of Confirmation of Cost Estimate and Signing Agreements (Pipeline Company)
- Sample 5** Roadway Upgrading Pipeline Crossing Agreement
- Sample 6** New Roadway over Existing Pipeline Crossing Agreement
- Sample 7** Letter of Confirmation of Cost Estimate (New Railway Crossing)
- Sample 8** Letter of Confirmation of Cost Estimate (Existing Railway Crossing Upgrading)
- Sample 9** Letter of Confirmation of Commencement of Construction

Note: Agreements for payment of utility adjustment costs are sometimes documented separately from the new "Utility Adjustment Agreement"

The Operations Manager needs to be informed or provided a written notice when there are implications on the operating/maintenance costs.

APPENDIX H

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SAMPLE 1

Our File: Hwy. XX:XX

Phone: (403) XXX-XXXX

Fax: (403) XXX-XXXX

Month XX, 20XX

Attention: Mr. Name

Utility Company Ltd.

Address

City, Alberta

X2X 3X5

Dear:

**RE: Hwy. XX:XX, Jct. Hwy. XX to South of Town
Grade Widening, Selective Gradeline Revision, Granular
Base Course Asphalt Concrete Pavement & Other Work**

We are working as Engineering Consultants on behalf of Alberta Transportation for the above noted project. The project involves highway widening for 16.7 kilometres, commencing at the Junction of Hwy. XX to South of Town. The existing right-of-way width is presently xx metres and it is proposed to widen by an additional xx metres on each side. We have identified five (5) pipeline crossings by your company within the limits of this project, as highlighted on the enclosed plans. Your facilities may be impacted by the proposed construction.

Please confirm the location of all facilities owned by your company that are within the project limits and provide us with a copy of your as-built records.

We request that you forward the names of the contact persons from your company for utility exposures and design coordination at this time.

Alberta Transportation has tentatively scheduled a September 2001 tender for this project. Construction is anticipated to commence in the spring of 2002.

If you require any further information or have any questions or concerns, please contact this office directly.

Yours truly,

**Name, Consultant's Title
Company Name**

Encl.

cc: Alberta Transportation - Project Sponsor

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SAMPLE 2

Our File: X:XX

Phone: (403) XXX-XXXX

Fax: (403) XXX-XXXX

Month XX, 20XX

Canadian Western Natural Gas Company Ltd.
c/o Mr. John Jones
Supervisor Pipelines
909 - 11th Avenue N.E.
Calgary, Alberta
T5R 1L8

Dear:

**RE: HWY. X:XX; W. OF JCT. S.H. XXX - JCT. HWY. X
Pipeline Plans; 1:02-61 & 1:02-62**

The enclosed four prints each of the above noted plans showing the affect our construction will have on your Company's pipelines. The impacted locations and suggestions are listed below:

Station 306+554.969 **Plan No. 1:02-62 No adjustments
proposed**

S.E. Ramp

Station 201+113.867 **Plan No. 1:02-61 Lower pipeline to
provide 1.4 minimum earth cover at the
lowest design ditch elevation**

Benchlands Connectors & **Install pipeline warning signs as
required**

**Station 300+393.008
on Ramp**

Your concurrence or alternate suggestion will be appreciated. Please submit a **detailed** estimate and breakdown of all costs (labour, materials, equipment, administration, etc.) for alternate suggestions, to the Consultant's office for approval.

Should you require any information please contact the Consultant's Representative, **Mr. John Smith of ABC Engineering Ltd. at (403) XXX-XXXX in Calgary.**

Please acknowledge receipt of the above information by signing both letters and also returning one for our file.

APPENDIX H

Sincerely,

**Name, Consultant's Title
Company Name**

Authorized Representative of CWNG

Date

cc: Signed Copy to: Alberta Transportation – Project Sponsor

SAMPLE 3

**Our File: Hwy. XX:XX
Utility Contract Agreements**

Phone: (403) XXX-XXXX

Fax: (403) XXX-XXXX

Month XX, 20XX

TransAlta Utilities Corporation
Deerfoot Atrium, Box 1900
Calgary, Alberta
T6B 2X3

**ATTENTION: Mr. John Jones
X & X Projects - Calgary Region**

Dear:

**RE: HWY. XX:XX, W. OF JCT. S.H. XXX - JCT. HWY X
UTILITY ADJUSTMENT COST ESTIMATE (\$11,111.00)**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$11,111.00 for the above noted project. AT agrees to reimburse TransAlta Utilities Corporation (TAU) based on actual close-out costs. This letter constitutes AT approval for TAU to proceed with the proposed powerline adjustments. No other approvals from any other branch of AT are required for this work. However, if there is a variation of more than 5% from the original cost estimate, TAU must contact the Consultant and approval is required prior to proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only) and various Utility Companies.

During the course of the project, the work sites of the Contractor, Consultant and Utility Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant and Utility Companies working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Utility Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations thereunder to ensure complete understanding respecting the responsibilities given and compliance required. The Utility Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations thereunder.

Coordinating Activities

The Utility Company shall coordinate its activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor are conducting activities within the project limits the Utility Company shall liaise with Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant and Utility Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Utility Company are not being performed on a highway/bridge construction project, the Utility Company shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department. The Consultant or Department as applicable, after

review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

TAU (or their Contractor) shall comply with the following:

- Implement traffic accommodation procedures if their operations interfere with normal pedestrian or vehicular traffic.
- Procedures on traffic accommodation implemented must be in accordance with Alberta Transportation typical standards as outlined in the current Traffic Accommodation in Work Zones Manual.
- Advise the Consultant and/or the Contractors when they plan to disrupt traffic and submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic for Alberta Transportation's review and comment.

You should forward your final invoice to the Consultant's office with the necessary back-up documentation and detailed breakdown for reimbursement. Contact with John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary is recommended in order to co-ordinate work within the project limits.

Please sign both letters and also return one for our file and forward the other copy to the Consultant.

Sincerely,

Name, Construction Manager
Region
Telephone Number

Authorized Representative of TAU

Witness

Date

Date

cc: Signed Copy to: Consultant
Company's Name
Company's Address

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SAMPLE 4

Our File: Hwy. XX:XX

Phone: (403) XXX-XXXX

Fax: (403) XXX-XXXX

Month XX, 20XX

XX Pipeline Ltd.
Address
Calgary, Alberta
T6B 2X3

**ATTENTION: Mr. Bob Jones
X & X Projects – Calgary Region**

Dear:

**RE: HWY. XX:XX, W. OF JCT. S.H. XXX – JCT. HWY X
CONFIRMATION OF PIPELINE ADJUSTMENT COST ESTIMATE (\$300,000)
AND SIGNING PIPELINE CROSSING AGREEMENT**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$300,000 for the above noted project. AT agrees to reimburse XX Pipeline Ltd. based on actual close-out costs. This letter constitutes AT approval for XX Pipeline Ltd. to proceed with the proposed pipeline adjustments. No other approvals from any other branch of AT are required for this work. However, if there is a variation of more than 5% from the original cost estimate, XX Pipeline Ltd. must contact the Consultant and approval is required prior to proceeding with the work.

Three copies of our standard Pipeline Crossing Agreement are enclosed. Please indicate your acceptance by signing and returning one copy for our file and one to the Consultant's office.

You should forward your final invoice to the Consultant's office with the necessary back-up documentation and detailed breakdown for reimbursement. Contact with John Smith of ABC Engineering Corp., Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary is recommended in order to co-ordinate work within the project limits.

Sincerely,

Name, Construction Manager
Region
Telephone Number

APPENDIX H

Encl. Three

cc: Signed Copy to: Consultant
Company's Name
Company's Address

SAMPLE 5

Our File: Hwy. X:XX

ROADWAY UPGRADING PIPELINE CROSSING AGREEMENT

This agreement is made as of the **XXth** day of **Month**, A.D. 20**XX**

BETWEEN

Her Majesty the Queen in right of the Province of Alberta
as represented by the Minister of Transportation
(hereinafter called the "Minister")

- and -

a body corporate registered and existing under the laws of
the Province of Alberta
(hereinafter called the "Operator")

WHEREAS the Minister intends to make improvements to a roadway known as **Hwy. XXX:XX** which may result in a ground disturbance within the controlled area (**Alberta Pipeline Act**) or Safety Zone (**National Energy Board Act**) of the Operator's pipelines in the land legally described as:

as shown on the attached Plan No.: _____, and adjustment costs as negotiated in a letter dated _____ which form part of this agreement.

AND WHEREAS the Operator obtained a permit from the Minister for placement of a pipeline under **Hwy. _____**.

NOW THEREFORE, pursuant to the applicable section of the **Alberta Public Highways Development Act**, the **National Energy Board Act**, **Alberta Pipeline Act and Regulation** the **Water Gas and Electrical Companies Act**, and the **Gas Distribution Act** (hereinafter called the "**Acts**"), the Minister and the Operator agree as follows:

1) The Operator's representative shall be:

(Name): _____

(Telephone Number): _____

(Address): _____

- 2) The Minister's representative shall be:
- (Name): _____, Construction Manager
- (Telephone Number): () - _____
- (Address): Alberta Transportation, _____ District
- 3) The Minister (or his delegate) shall contact the Operator at least seventy-two (72) hours (excluding Saturdays, Sundays and Statutory Holidays) prior to undertaking any excavation or construction within the controlled area as defined in the Pipeline Act, or Safety Zone as defined in the National Energy Board Act, as the case may be. The Operator, upon receiving such notice, shall make arrangements to have a representative present during the period machinery is to be used within the controlled area or safety zone, as the case may be, and to witness the exposure of the Operator's pipeline(s). No excavation or construction of any sort shall be carried out within the controlled area or safety zone, as the case may be, until the Operator's representative is present at the site and has authorized same, unless the Operator has advised otherwise by written notice to the Minister.
- 4) The Operator shall locate and mark the horizontal position of the Operator's pipeline(s) as requested by the Minister at the Operator's sole cost.
- 5) The Operator's pipeline shall be exposed under the direction of the Operator by hand digging or other acceptable method such as excavation by water or air jets to determine the exact location and depth of cover before construction is undertaken over it. The cost of this exposure shall be borne by the Minister.
- 6) In the event pipeline work is required and the Operator is authorized by the Minister to carry out the work, the Operator shall carry out all necessary and permanent protection, adjustment or relocation of their pipeline(s) as required to accommodate the roadway construction.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Operator (Pipeline Company).

During the course of the project, the work sites of the Contractor, Consultant, Utility Companies and the Operator may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and the Operator working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure

that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Operator shall familiarize itself, it's staff and it's subcontractors with the terms of the Occupational Health and Safety Act and Regulations thereunder to ensure complete understanding respecting the responsibilities given and compliance required. The Operator acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations thereunder.

Coordinating Activities

The Operator shall coordinate it's activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Operator shall liaise with the Consultant and/or Contractor and/or Utility Companies as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, Utility Companies and the Operator shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Operator are not being performed on a highway/bridge construction project, the Operator shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department. The Consultant or Department as applicable, after review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

- 7) If the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act and National Energy Board Pipeline Crossing Regulations, the Operator agrees to carry out the work in accord with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/94, s. 2(f) (as amended).
- 8) In the event that the Minister authorizes the pipeline work to be done by a person, either legal or natural, other than the Operator, the Minister agrees to require that person to fulfill the responsibilities and duties of the Prime Contractor as that term is used in the Occupational Health and Safety Act, R.S.A 1980, as amended, and any regulations made pursuant to that Act. However, if the pipeline work is of such a kind as to fall within the purview of the National Energy Board Act, and the National Energy Board Pipeline Crossing Regulations, the Minister agrees to require the person to carry out the work in accordance with the Canada Labour Code R.S.C. (as amended) and the Oil and Gas Occupational Safety and Health Regulations SOR/94 s.2(f) (as amended).
- 9) The Minister shall carry out all work within the controlled area or safety zone, as the case may be, in accordance with good engineering and construction practices, and in accordance with the relevant Acts.
- 10) The Minister shall ensure that no equipment, material or vehicles will be stored, parked or driven over or along the controlled area or safety zone, as the case may be, except as reasonably necessary in the actual construction of the roadway.
- 11) If any excavation or construction equipment is to be moved across the controlled area or safety zone, as the case may be, prior to excavation or construction, and as a temporary protective measure, the Operator may require direct protective measures in accordance with good engineering and construction practices, and in accordance with the relevant Acts, to be placed across the Operator's pipeline(s) at the point of crossing, the cost of which shall be borne by the Minister.

-
- 12) The Minister shall be liable for and shall indemnify and save harmless the Operator from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Operator's pipeline(s), which the Operator may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Minister, his employees, servants or agents.
- 13) The Operator shall be liable for and shall indemnify and save harmless the Minister from all manner of actions, causes of action, proceedings, claims, demands, costs, damages and expenses whatsoever including damage to the Minister's facilities which the Minister may sustain, pay or incur as a result of or in connection with any breach of the obligations assumed under this document by, or the negligence of, the Operator or any person for whom the Operator is responsible at law or in equity.
- 14) In the event the Operator is performing any work on its pipeline, the Operator (or their Contractor) shall comply with the following:
- Implement traffic accommodation procedures if their operations interfere with normal pedestrian or vehicular traffic.
 - Procedures on traffic accommodation implemented must be in accordance with Alberta Transportation typical standards as outlined in the current Traffic Accommodation In Work Zones Manual.
 - Advise the Consultant and/or the Contractors when they plan to disrupt traffic and submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic for Alberta Transportation's review and comment.
- 15) Any written notice required or permitted hereunder shall be directed to the party to whom it will be given (hand delivered, sent by prepaid mail, or sent by telecommunication), addressed as follows:

(a) **To the Minister:**

Alberta Transportation
_____ **Region**

ATTENTION: Name
Construction Manager
Region

(b) **To the Operator:**

ATTENTION:

And in the event of mail service disruption, such notice shall be delivered by hand.

- 16) Where the terms and conditions in this document contradict any portion of the Acts, the latter shall prevail.
- 17) The terms and conditions of this agreement shall be effective from the date shown at the beginning of this agreement.

**Executed on behalf of the
Operator by:**

**Executed on behalf of the
Minister by:**

Name
Title

Name
Construction Manager
Region

New Roadway Over Existing Pipeline Crossing Agreement

THIS AGREEMENT is made and effective as of the ____ day of, 20____.

BETWEEN _____ ("**Grantor**")
(*hereinafter and in Schedules A, B & C referred to as the Grantor*)

and *Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Alberta Transportation* ("**the Minister**")
(*hereinafter and in Schedules A, B & C referred to as the Minister*)

WHEREAS Grantor operates under the jurisdiction of the National Energy Board, Alberta Energy and Utilities Board, or Alberta Energy, and holds *permits, approvals, or authorizations* for a pipeline across the said lands and has constructed a pipeline therein, hereinafter referred to as "**Grantor's Facility**"; and

WHEREAS the Minister desires to construct *the Minister's Facility* across the "**Grantor's Facility**" and has acquired *an interest in* the said lands and proposes to install therein a roadway (Hwy. _____) hereinafter referred to as "**the Minister's Facility**"; and

WHEREAS the *lands* and/or Facilities of the respective parties intersect in the Crossing Area; and

WHEREAS the parties wish to define their respective rights and liabilities with respect to the Crossing Area under certain terms and conditions defined in Schedule "A".

NOW THEREFORE THIS AGREEMENT WITNESSES that in consideration of the premises, mutual covenants and agreements herein contained, the parties agree that their respective Work in the Crossing Area shall be governed by this Agreement together with the Schedules as herein described.

1. Terms and Conditions

This Agreement including the recitals and the following Schedules, which are attached hereto and made part hereof, shall be the terms and conditions as agreed to by Grantor and the Minister:

Schedule "A" - Mutually Agreed to Terms and Conditions.

Schedule "B" - Location Plan and Profile.

Schedule "C" - Specific Terms and Conditions.
(the "Schedules")

2. LOCATION AND NOTICES

(a) Location of Crossing Area (Legal Description):

(b) Notices:

	<u>Grantor's Corporate Office</u>	<u>Minister's Office</u>
Name:		
Address:	<hr/> <hr/>	<hr/> <hr/>
Dept.:	<hr/>	<hr/>
Phone:	<hr/>	<hr/>
Fax:	<hr/>	<hr/>
email:	<hr/>	<hr/>

(c) Field Representative:

	<u>Grantor's</u>	<u>Minister's Representative</u>
Name:		
Position:::	<hr/>	<hr/>
Address:	<hr/> <hr/>	<hr/> <hr/>
Phone:	<hr/>	<hr/>
Fax:	<hr/>	<hr/>
email:	<hr/>	<hr/>
Alternate:	<hr/>	<hr/>
Phone:	<hr/>	<hr/>
Fax:	<hr/>	<hr/>
email:	<hr/>	<hr/>

IN WITNESS WHEREOF the parties hereto have caused this Agreement to be duly executed.

"Grantor"

Executed on behalf of the Minister

Per: _____

Name:

Per: _____

Title:

This page has been left blank intentionally.

Schedule "A"

Mutually Agreed to Terms and Conditions

This Schedule "A" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____ **(Grantor)**

and Her Majesty the Queen in right of the Province of Alberta as represented by the Minister of Alberta Transportation **(the Minister)**

and dated the _____ **day of** _____, **20**_____.

1. Interpretation

1.01 In this Agreement, including the recitals, the words and terms used shall have the following meanings:

- (a) "Crossing Area" means the area of intersection of Grantor's *rights of way* and the Minister's *interest in the said lands* and/or Facilities as outlined in Schedule "B";
- (b) "*Minister*" means the Minister of Alberta Transportation or his delegate;
- (c) "Minister's Facility" means the facility or facilities to be constructed by the Minister and to be located within, across, along, upon, over or under the Crossing Area;
- (d) "Grantor's Facility" means the facility or facilities of Grantor located within, across, along, upon or under the Crossing Area;
- (e) "Facility" means:
 - i) any structure that is constructed or placed on or in the right-of-way within the Crossing Area (*including but not limited to* concrete slab, concrete conduit, retaining wall, and special fences such as chain link); and
 - ii) any highway, public or private road, railway, irrigation ditch, drain, drainage system, sewer, dike, cable line, telecommunication line, telephone line or line for the transmission of hydrocarbons, power or any other substance that is or is to be carried across, along, upon, over or under the Crossing Area;
- (f) "said lands" means the lands described in Schedule "B";
- (g) "the Body of this Agreement" means the Agreement to which this Schedule is attached and which has been executed by the parties;
- (h) "this Agreement" means the Body of this Agreement and the Schedules attached to it; and

- (i) "Work" means, with respect to a Facility, the carrying, laying, installing, constructing, maintaining, operating, repairing, inspecting, replacing, altering, removing, abandoning and such other operations as may be required from time to time.
- 1.02 Unless a term or provision contained in the Body of this Agreement, if acted upon, would result in violation of any code, statute, law, regulation, permit, license, or governmental order, the following shall apply:
- (a) if any term or provision conflicts with a term or provision contained in any Schedule, the term or provision in the Schedule shall prevail.
 - (b) If any terms or provisions of the Schedules conflict, the following shall apply: Schedule "C", if present, shall prevail over Schedules "A" and "B", Schedule "B" shall prevail over Schedule "A".

2. Consent

Grantor hereby agrees, insofar as it has the right to do so, that the Minister may perform the Work on the Minister's Facility in the Crossing Area in accordance with the terms and conditions of this Agreement.

3. Compliance with Statutes and Regulations

- (a) The Minister shall at all times comply with any and all applicable codes, statutes, laws, regulations, permits, licenses, orders and directions of any *Federal or Provincial* governmental authority from time to time in force. The minimum applicable technical standards therein shall apply to both parties unless more stringent standards are provided for in this Agreement. If compliance with any provision of this Agreement would result in violation of any applicable codes, statutes, laws, regulations, permits, licenses, orders and directions of any *Federal or Provincial* governmental authority, such code, statute, law, regulation, permit, license, order and direction of any *Federal or Provincial* governmental authority shall prevail and this Agreement shall be deemed to be amended accordingly.

The Minister agrees to require any agent or contractor who performs work, as defined by this agreement, on behalf of the Minister to comply with the applicable provincial or federal legislation and regulations governing occupational health and safety.

- (b) During the course of the project, the work sites of the Contractor, Consultant (the Department employs an engineering consultant on construction projects only), Utility Companies and the Grantor may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant and Utility Companies working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Grantor shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations thereunder to ensure complete understanding respecting the responsibilities given and compliance required. The Grantor acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations thereunder.

Coordinating Activities

The Grantor shall coordinate its activities on the project with those of the Consultant and the Contractor. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Grantor shall liaise with the Consultant and/or Contractor and/or Utility Companies as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, Utilities Companies and the Grantor shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be resolved by all parties at the site.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

4. Position of Facility

Unless otherwise indicated in any of the Schedules, or ordered by a *Federal or Provincial* governmental authority or regulations *the Grantor's Facility shall have the lower physical position in the Crossing Area;*

5. Conditions

When the Minister performs work on the Minister's Facility in the Crossing Area, the following terms and conditions shall apply:

- (a) The Minister's Field Representative shall contact Grantor's Field Representative directly, either in person or by telephone, a minimum of 72 hours (excluding Saturdays, Sundays and Statutory Holidays) before commencement of the Minister's Work within 30 meters of the Crossing Area and, if unable to contact that person, the Minister shall serve a minimum of 72 hours written notice pursuant to Clause 8 hereof before commencement of the Minister's Work.
- (b) Grantor has the right to have a representative present to inspect the Work of the Minister in the Crossing Area.
- (c) During installation pursuant to this Agreement, the Minister's Representative shall have available at the Crossing Area a copy of this Agreement.
- (d)
 - (i) *Before proceeding to excavate within 5 metres of the Crossing Area, the Minister shall require the Grantor to expose its Facility by hand digging or other acceptable method such as excavation by water or air jets. The Minister shall not use or permit the use of an excavating machine within 1.5 metres of either side of any existing Grantor's Facility, or 3.0 metres of either side of any existing Grantor's Facility as required under the National Energy Board Act and Regulation, as the case may be, unless otherwise agreed to in Schedule "C".*
 - (ii) *The cost of the exposure referred to in (d)(i) above shall be borne by the Minister.*
- (e) *Notwithstanding clause 5(d) above, the Grantor shall carry out any necessary and permanent protection, adjustment, or relocation of the Grantor's facility that is made necessary by the construction of the Minister's Facility.*
- (f) The Minister shall, where applicable, install and maintain during performance of the Work suitable markers indicating the location of Grantor's Facility in the Crossing Area.
- (g) The Minister shall lay down and construct its Facility in accordance with the Schedules to this Agreement.
- (h) The Minister shall carry out all Work in the Crossing Area in a proper and diligent manner and in accordance with good engineering and construction practices.
- (i) The *Minister* shall ensure no damage occurs to existing Facilities while the Work is being performed in the Crossing Area including damage which may result from the use of heavy work equipment outside the Crossing Area while performing the Work in the Crossing Area.
- (j) In the event that Grantor's Facility suffers contact damage or other damage as a result of the Minister's Work, Grantor shall be notified forthwith and its repair shall be carried out as directed by Grantor at the Minister's cost.

-
- (k) Where cathodic protection is required *to be modified* by Grantor as a result of the Minister's installation, the *Grantor at its cost shall, at the time of the construction of the Minister's Facility, modify and thereafter maintain a cathodic protection system for Grantor's Facility at the crossing. The Grantor shall provide a cost estimate of the installation of the cathodic protection system prior to construction of the Minister's Facility, and upon approval of all or a part of the costs of the installation of the cathodic protection system by the Minister, the Minister shall reimburse the Grantor in accordance with the attached Schedule "C"*.
- (l) At least 24 hours (excluding Saturdays, Sundays and Statutory Holidays) prior to covering Grantor's exposed Facility, the Minister's Field Representative shall contact Grantor's Field Representative directly, either in person or by telephone for inspection.
- (m) (i) *Where backfilling the excavation in the Crossing Area is required as a result of the Minister's installation, the Grantor may elect to backfill in accordance with Standard Specifications for Highway Construction (Alberta Transportation, current edition). Upon such election, the Grantor at its cost shall, at the time of the construction of the Minister's Facility, backfill the Crossing Area. The Grantor shall provide a cost estimate to backfill the Crossing Area, and upon approval of all or a part of the costs to backfill the Crossing Area by the Minister, the Minister shall reimburse the Grantor in accordance with the attached Schedule "C"*.
- (ii) *In the event the Grantor elects not to backfill the Crossing Area, and unless otherwise directed by the Grantor, the Minister shall cover Grantor's Facility with at least 30 centimetres of select backfill material as specified in Schedule "C" prior to commencing backfilling operations. The Minister shall, in backfilling the excavation in the Crossing Area, compact the fill material in 15 centimetre layers, or such greater depth specified by Grantor's Field Representative.*
- (n) The Minister shall, as soon as it is reasonably practical after the completion of the Minister's Work in the Crossing Area, restore the surface of the Crossing Area as closely as is practical to the condition in which it existed immediately prior to the Work being commenced.
- (o) The Minister shall maintain the Crossing Area in good order and condition and carry out expeditiously all Work hereunder.
- (p) The cost associated with the location, identification or supervision of the Grantor's facility shall not be charged to or borne by the Minister unless specified in Schedule "C".

6. Remedy on Default

In the case of default by the Minister in carrying out any of the provisions of this Agreement, Grantor may give notice thereof to the Minister. If the Minister fails to commence to remedy such default within 15 days after receipt of such notice and diligently complete such remedy thereafter, Grantor may take such steps as are appropriate to remedy such default and the Minister shall be liable for and shall pay all reasonable costs and expenses incurred by Grantor in remedying the default.

7. Further Work

- (a) If, subsequent to the initial Work undertaken by the Minister for its Facility, *the Minister* desires to undertake any Work in the Crossing Area in respect of its Facility, this Agreement shall be deemed to grant consent to *the Minister*, and the provisions of this Agreement shall apply *as the context requires* to all subsequent Work undertaken by *the Minister* under this Clause 7.
- (b) Notwithstanding the foregoing, installation of any Facility by the Minister other than those shown on attached Schedule "B" shall require a separate New Roadway Over Existing Pipeline Crossing Agreement.
- (c) Notwithstanding the foregoing, if emergency Work in the Crossing Area is required with respect to a party's Facility, that party shall commence the necessary Work and shall forthwith give the other party's Field Representative verbal notice of the emergency and necessary Work, and shall forthwith give notice pursuant to Clause 8 hereof.

8. Notices

Notices shall be in writing and shall be sent to the parties at the addresses for notice shown in the Body of this Agreement. The following shall govern notices:

- (a) Either party may from time to time change its address for service by giving notice to the other party.
- (b) All notices required to be given hereunder may be delivered by hand, mailed by registered or prepaid mail, or sent by telecommunication. If mailed, the notice shall be deemed to have been received seven days (Saturdays Sundays and Statutory Holidays excluded) after the mailing thereof. If delivered by hand, the notice shall be deemed to have been received on the day on which it was delivered, or if delivered after regular business hours, it shall be deemed to have been received on the following business day. If sent by telecommunication, the notice shall be deemed to have been received on the first business day following the day it was dispatched.
- (c) No notice shall be effective if mailed during any period in which Canadian postal workers are on strike or if a strike of postal workers is imminent and may be anticipated to affect normal delivery thereof.
- (d) Notwithstanding the foregoing, to the extent described in this Agreement, Grantor's and the Minister's Field Representatives or designated alternates shall have the right and authority to make, give, receive any notice, information, direction or decision required in conducting Work hereunder.

9. Liability and Indemnity

(a) Liability:

- (i) The Minister shall be liable to Grantor for all loss, damages and expenses which Grantor may suffer, sustain, pay or incur by reason of any matter or thing arising out of or attributable to any act or omission of the Minister, his servants, agents

or employees in respect of the Minister's use of the Crossing Area or by reason of this Agreement.

- (ii) Grantor shall be liable to the Minister for all loss, damages, and expenses which the Minister may suffer, sustain, pay or incur by reason of any matter or thing arising out of or attributable to any act or omission by Grantor, its servants, agents or employees in respect of Grantor's use of the Crossing Area or by reason of this Agreement.

(b) Indemnity:

- (i) The Minister shall indemnify and save harmless the Grantor against all actions, proceedings, claims, demands, and costs which may be brought against or suffered by Grantor or which it may sustain, pay or incur, by reason of any matter or thing arising out of or attributable to any act or omission of the Minister, its servants, agents or employees in respect of the Minister's use of the Crossing Area or by reason of this Agreement.
- (ii) Grantor shall indemnify and save harmless the Minister against all actions, proceedings, claims, demands, and costs which may be brought against or suffered by the Minister or which it may sustain, pay or incur, by reason of any matter or thing arising out of or attributable to any act or omission of Grantor, its servants, agents or employees in respect of Grantor's use of the Crossing Area or by reason of this Agreement.

10. Insurance

- (a) Without in any way limiting the liability of either party under this Agreement, each party shall obtain and keep in force during the term of this Agreement comprehensive general liability insurance covering liability for bodily injury and property damage arising from Work contemplated by this Agreement. The limit of this insurance shall not be less than five million dollars, inclusive, for any one occurrence unless otherwise agreed by the parties in writing. This policy shall provide coverage for liability assumed under this Agreement.
- (b) A party, upon request of the other party, shall furnish written documentation, satisfactory to the requesting party, evidencing the required coverage.
- (c) As an alternative to the five million dollar policy of comprehensive general liability insurance referred to in Subclause 10 (a), if acceptable to the other party, a party may self-insure against the risks normally covered by such a policy.

11. Changes to Agreement

No change, modification or alteration of this Agreement shall be valid unless it be in writing and signed by the parties hereto, and no course of dealing between the parties shall be construed to alter the terms hereof.

12. Assignment

- (a) Neither party to this Agreement shall assign or transfer this Agreement or the rights and privileges hereby granted without the written consent of the other

party, and such consent shall not be unreasonably withheld. The party intending to assign or transfer this Agreement shall give to the non-assigning party to this Agreement notice of its intent by registered mail.

- (b) The non-assigning party to this Agreement may require the assignor and assignee to execute a novation agreement in a form acceptable to the non-assigning party.

This Agreement shall endure to the benefit of and be binding upon the parties, their successors and assigns.

13. Governing Law

This Agreement and the rights and obligations of the parties herein shall be governed and construed according to the laws of the province of *Alberta*.

14. Term

The rights and obligations of the parties under this Agreement shall terminate:

- (a) two years from the date hereof if construction of the Minister's Facility has not commenced, or
- (b) upon proper abandonment or removal of all of Grantor's or the Minister's Facilities from the Crossing Area and the completion of any reclamation Work required by applicable laws, except for those rights acquired and obligations incurred prior to such events.

15. Miscellaneous

- (a) In this Agreement, words importing the singular include the plural and vice versa; words importing the masculine gender include the feminine and vice versa; and words importing persons include firms or corporations and vice versa.
- (b) Words such as "hereto", "thereto", "hereof", and "herein", when used in this Agreement, shall be construed to refer to provisions of this Agreement.
- (c) The headings of all clauses of this Agreement, and the Schedules, are inserted for convenience of reference only and shall not affect the meaning or construction thereof.
- (d) Time is of the essence of this Agreement.
- (e) No waiver of any breach of a covenant or provision of this Agreement shall take effect or be binding upon a party unless it is expressed in writing. A waiver by a party of any breach shall not limit or affect that party's rights with respect to any other or future breach.

16. Entire Agreement

This Agreement, including the recitals and schedules, sets forth the entire agreement between the parties hereto and shall be deemed to have superseded any and all previous agreements and understandings, whether written or oral, between the parties

dealing with the Facilities and the Crossing Area, and all rights and obligations as herein described.

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Schedule "B"

Location Plan and Profile

This Schedule "B" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____(Grantor)

and _____(the Minister)

and dated the _____ day of _____, 20_____.

This page has been left blank intentionally.

Schedule "C"

Specific Terms and Conditions

This Schedule "C" to Form Part of the New Roadway Over Existing Pipeline Crossing Agreement.

Between _____(Grantor)

and _____(the Minister)

and dated the _____ day of _____, 20_____.

NOTE: All invoices for the items listed below (if applicable) shall be directed to the Minister's Representative.

NOTE: *Attach a copy of any existing permit, approval or authorization held by the Grantor as part of Schedule "C" here ((as per clause 1.02(b)).*

NOTE: *Permission to use an excavating machine within 1.5 metres of either side of any existing Grantor's Facility as required under the Pipeline Act and Regulation, or 3.0 metres of either side of any existing Grantor's Facility as required under the National Energy Board Act and Regulation, as the case may (if applicable) here ((as per clause 5(d)(i)).*

NOTE: *Attach a copy of the Grantor's cost estimate of the installation of the cathodic protection system (if any) here ((as per clause 5(k)).*

NOTE: *Attach a copy of the Grantor's cost estimate for backfilling the excavation in the Crossing Area (if any) here ((as per clause 5(m)(i)).*

NOTE: *Attach a copy of the Grantor's specification for backfill (if any) here ((as per clause 5(m)(ii)).*

NOTE: *Attach a copy of the cost associated with the location, identification or supervision of the Grantor's facility to be borne by the Minister (if applicable) here ((as per clause 5(p)).*

APPENDIX H

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SAMPLE 7

**Our File: Hwy. XX:XX
Railway Crossing Contract Agreements**

Phone: (403)XXX-XXXX

Fax: (403)XXX-XXXX

Month XX , 20XX

Central Western Railway
1407 Scotland Street SW
Calgary, Alberta
T3C 3W3**ATTENTION: Technical Support Engineer**

Dear:

**RE: INTERSECTION HWY XX:XX
NEW RAILWAY CROSSING AGREEMENT**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$163,400.00 for the above noted project. AT agrees to reimburse Central Western Railway based on actual close-out costs. This letter constitutes AT approval for Central Western Railway to proceed with the construction of the proposed new railway crossing. No other approvals from any other branch of AT are required for this work. If there is a variation of more than 5% from the original cost estimate, Central Western Railway must contact the Consultant and approval is required prior to proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Railway Company.

During the course of the project, the work sites of the Contractor, Consultant, the Utility Companies and Railway Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and Railway Company working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Railway Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations thereunder to ensure complete understanding respecting the responsibilities given and compliance required. The Railway Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations thereunder.

Coordinating Activities

The Railway Company shall coordinate its activities on the project with those of the Consultant, the Contractor and the Utility Companies. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Railway Company shall liaise with the Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(I) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, the Utility Companies and the Railway Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Railway Company are not being performed on a highway/bridge construction project, the Railway Company shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department. The Consultant or Department as applicable, after

review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

A transfer of ownership of land from the existing road allowance will be made from the Crown to the Central Western Railway in exchange for a transfer of ownership of land required for the new crossing (as shown on the attached plan). All survey and associated land registration costs would be to the account of Alberta Transportation.

The cost of maintenance and operation of the signal protection shall be paid according to the current agreement which states that fifty percent of the above mentioned cost is paid by Alberta Transportation and fifty percent by the Central Western Railway Company.

Other maintenance costs shall be apportioned based on seniority. According to current guidelines the road authority being the junior party at the new location shall be wholly responsible for the maintenance or the rubber planking.

You should forward your final invoice to the Consultant's office with the necessary back-up documentation and detailed breakdown for reimbursement. Contact with John Doe of ABC Consulting Group Ltd., the Consultant's Representative, at telephone number (403)XXX-XXXX in Edmonton is recommended in order to coordinate work within the project limits.

Please sign both letters and return one for our file, and forward the other to ABC Consulting Group.

Sincerely,

Name, Construction Manager
Region
Telephone Number

APPENDIX H

Authorized Representative of
Central Western Railway
Title

Witness

Date

Date

c.c. Signed Copy to: Consultant
 Company's Name
 Company's Address

SAMPLE 8

**Our File: Hwy. XX:XX
Railway Crossing Agreements**

Phone: (403) XXX-XXXX

Fax: (403) XXX-XXXX

Month XX, 20XX

Canadian National, Great Plains District
Floor 26, CN Building
10004 - 104 Avenue
Edmonton, Alberta
T5J 0K2

**ATTENTION: Technical Support Engineer
Great Plains District**

Dear:

**RE: HWY. XX:XX, CN RAILWAY CROSSING (NORTH OF XXXXX)
FULL DEPTH RUBBER MATERIAL
COST ESTIMATE (\$17,490.00)**

Please be advised that Alberta Transportation (AT) acknowledges receipt of your cost estimate of \$17,490.00 for the above noted project. AT agrees to reimburse Canadian National (CN) based on actual close-out costs. This letter constitutes AT approval for CN to proceed with the proposed Highway XX:XX Railway Crossing adjustments. No other approvals from any other branch of AT are required for this work. If there is a variation of more than 5% from the original cost estimate, CN must contact the Consultant and approval is required prior to proceeding with the work.

OCCUPATIONAL HEALTH AND SAFETY ACT

Alberta Transportation (the Department) assigns prime contractor responsibilities, as specified in the Occupational Health and Safety Act, to all parties with which it enters into contracts and agreements. On highway and bridge construction or maintenance projects this would typically include a Contractor, a Consultant (the Department employs an engineering consultant on construction projects only), various Utility Companies and the Railway Company.

During the course of the project, the work sites of the Contractor, Consultant, the Utility Companies and Railway Company may be separated by time and/or space or, may be in the same general vicinity or may be adjacent, depending on the circumstances on the project at any given point in time. It is a requirement of all Department contracts and agreements that the Contractor, Consultant, Utility Companies and Railway Company working within the project limits, coordinate their respective activities, as outlined herein, to ensure a safe project. However, it is not the Department's intent that any of these parties be responsible to ensure that the other parties, or the other parties' subcontractors, have adequate health and safety process for their respective activities.

Designation of Prime Contractor

The Railway Company shall familiarize itself, its staff and its subcontractors with the terms of the Occupational Health and Safety Act and Regulations thereunder to ensure complete understanding respecting the responsibilities given and compliance required. The Railway Company acknowledges that it is and assumes all of the responsibilities and duties of the Prime Contractor, as defined by the Occupational Health and Safety Act, and that it shall as a condition of this Agreement, comply with the Occupational Health and Safety Act and the regulations thereunder.

Coordinating Activities

The Railway Company shall coordinate its activities on the project with those of the Consultant, the Contractor and the Utility Companies. When the Consultant and/or Contractor and/or Utility Companies are conducting activities within the project limits the Railway Company shall liaise with the Consultant and/or Contractor as the case may be, and jointly develop a health and safety system or process for the affected worksites. The health and safety system or process agreed to by the parties must be in writing. Any changes required to the health and safety system must be agreed to by all affected parties and must also be in writing. Documenting the written health and safety system or process, including any required changes shall be the responsibility of the Contractor.

(i) Coordinating activities on Highway and Bridge Construction Projects

For the purposes of coordinating activities on highway/bridge construction projects, the contact persons for the Contractor, Consultant, the Utility Companies and the Railway Company shall be identified at the pre-construction meeting for the project. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

(ii) Coordinating activities not associated with a Highway or Bridge Construction Project

When the activities of the Railway Company are not being performed on a highway/bridge construction project, the Railway Company shall contact the local Alberta Transportation office prior to commencing work, to obtain the name of the contact person for the Department's highway maintenance contractor. The responsibility to initiate "contact" for coordinating activities shall reside with the party entering a project or site on which work has commenced. This responsibility to initiate contact shall apply regardless of whether or not the worksites are separated by time and/or space, are in the same general vicinity or are adjacent.

Resolving Disputes Related to Coordination of Activities

If the parties cannot agree on a process or system that addresses the safety concerns of all parties, work at the affected worksites shall cease and this matter shall be referred to the Consultant. However, if the Consultant is one of the parties involved in the dispute, or the Department has not employed a Consultant for the project, the matter shall be referred to the Department. The Consultant or Department as applicable, after

review, will decide which party shall be responsible for resolving the disputed safety issue. Such decision shall be final and binding upon all parties.

Responsibility for Subcontractors/Owner operators

The Prime Contractor shall, to the extent required by the Occupational Health and Safety Act, establish and maintain a Health and Safety system or process to ensure compliance to the Act by his subcontractors/owner operators.

CN Railway (or their Contractor) shall comply with the following:

- Implement traffic accommodation procedures if their operations interfere with normal pedestrian or vehicular traffic.
- Procedures on traffic accommodation implemented must be in accordance with Alberta Transportation typical standards as outlined in the current Traffic Accommodation in Work Zones Manual.
- Advise the Consultant and/or the Contractors when they plan to disrupt traffic and submit a traffic control plan and a written Traffic Accommodation Strategy to address for the safe accommodation of traffic for Alberta Transportation's review and comment.

You should forward your final invoice to the Consultant's office with the necessary back-up documentation and detailed breakdown for reimbursement. Contact with John Smith of ABC Engineering Corp., the Consultant's Representative, at telephone number (403) XXX-XXXX in Calgary is recommended in order to co-ordinate work within the project limits.

Please sign both letters and return one for our file and forward the other copy to the Consultant.

Sincerely,

Name, Construction Manager
Region
Telephone Number

**Authorized Representative of Canadian
National Great Plain District**

Witness

Date

Date

APPENDIX H

cc: Signed Copy to: Consultant
Company's Name
Company's Address

SAMPLE 9

Our File: Hwy. XX:XX

Phone: (780) XXX-XXXX
Fax: (780) XXX-XXXX

Month XX, 20XX

Attention: Mr. Name
Utility Company Ltd.
Address
City, Alberta
X2X 3X5

Dear:

**RE: Hwy. XX:XX, Jct. Hwy. X to South of Town
Date for Commencement of Construction**

By way of this letter and on behalf of Alberta Transportation, **Consultant's Name** is informing you that the tentative date for commencement of construction for the above noted project is April 01, 2002.

The Prime Contractor is:

Name:	ATTN: Name:
Address:	Phone:
	Fax:

The grading sub-contractor is:

Name:	ATTN: Name:
Address:	Phone:
	Fax:

According to the contract specifications between Alberta Transportation and the Prime Contractor, the Prime Contractor is required to coordinate and schedule their field operations with the applicable utilities companies.

If you have any questions please contact the undersigned at **phone no.**

Yours truly,

Name, Consultant's Title
Company Name

APPENDIX H

cc: Signed Copy to: Prime Contractor
Alberta Transportation – Project Sponsor

APPENDIX “I”

SAMPLE COST ESTIMATES AND SUMMARY

APPENDIX I

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Preliminary Cost Estimate Summary



ESTIMATE TYPE "A"

Hwy 99:06

ABC Project No. 1234-01-56789

North/South Limits Sta 0+123 to Sta 14+123

Total Length N/S (km): 14.000

Design Designation: RAU-211.8 std Ultimate

Grading, Base Paving and Bridge Construction

	GRADING	ILLUM.	BASE/PAVE	BRIDGES	TOTAL
(ref Engr)	(remaining)	(\$10k)	(7%)	(12%)	(12%)
CONTRACT COST	\$4,900,000	\$90,000	\$3,300,000	\$4,880,000*	\$13,170,000
	<small>(14km x \$329,000/km)</small>		<small>(14km x \$242,000/km)</small>	<small>* based on bridge planning</small>	
Contingencies (10%)	\$490,000	\$9,000	\$330,000	\$488,000	\$1,317,000
ENGINEERING (ass. 12% total)	\$753,400	\$10,000	\$231,000	\$585,600	\$1,580,000
RIGHT OF WAY	\$0				\$0
TOTALS	\$6,143,400	\$109,000	\$3,861,000	\$5,953,600	\$16,067,000

TOTAL \$ 16,067,000

* based on bridge planning

REMARKS:

1. Engineering Costs are assumed at 12%
2. Estimate based on 2002 Dollars.
3. R/W for project is presently in place. R/W estimate \$s awaiting Regional input.
4. No detailed information available for Utilities estimate.
5. Proposed Hwy 99 Access Management improvements are not included at this time but could greatly impact the wetland Replacement costs (frontage service roads). Work in Wetlands may also have timing constraints (migratory birds).

Prepared by:

Date: October 5, 2001

Copy to:

APPENDIX I

GRADING DESIGN ESTIMATE FORM

ESTIMATE TYPE: " B "
 FROM: West of _____
 Km 12.345 To Km 28.345
 DESIGN DESIGNATION: RAU 209-110
 INITIATED BY: _____
 DATE: _____

PROJECT: SH 999:00
 TO: East of _____
 LENGTH: 16.000 Km
 SUBGRADE WIDTH: 12.6 m
 NATURE OF PRIORITY: _____

ITEM	UNIT	QUANTITY	UNIT PRICE	ESTIMATED COST
Common Exc.	m ³	113,000	\$1.90/m ³	\$214,700.00
Borrow Exc.	m ³	390,000	\$2.00/m ³	\$780,000.00
B.T.S. Exc.	m ³	40,000	\$1.00/m ³	\$40,000.00
Channel Exc.	m ³	40,000	\$3.00/m ³	\$120,000.00
Rock Exc.	m ³			
Com/Bor Truck Haul	m ³			

Total Excavation: 583,000

Clearing	ha	38	\$2500.00/ha	\$95,000.00
Fencing	km			
Overhaul	m ³ km	150,000	\$0.75/m ³ km	\$112,500.00
Water	m ³			

TOTAL ESTIMATED COST: \$1,362,200.00

x 1.25 factor = \$1,702,750.00

<u>Right-of-Way</u>	
R/W: _____ ha @ _____ \$/ha = _____	
R/W: _____ ha @ _____ \$/ha = _____	
Damages = _____	
Total = _____	

<u> 10 % </u> Contingencies	<u> \$170,275.00 </u>
<u> 18 % </u> Engineering	<u> \$306,495.00 </u>
<u> 4 % </u> Materials	<u> \$68,110.00 </u>
Right-of-Way	
Borrow Agreements	
Utilities	<u> \$30,000.00 </u>

TOTAL FOR "GRADING ESTIMATE": \$2,277,630.00

<u>Borrow Agreements</u>	
Borrow Pits: _____ ha @ _____ \$/ha = _____	
Backslopes: _____ ha @ _____ \$/ha = _____	
Damages = _____	
Total = _____	

- Subtract Right-of-Way _____
 + Gravel Surfacing (Grading Only) \$40,800.00

TOTAL FOR "PROGRAM ESTIMATE" \$2,318,430.00

(Total CPMS Grading "B" Est.)

Estimate based on 20 Dollars. Prepared by: _____ Date: _____

REMARKS: No work on bridge structures. R/W and borrow costs already in place.

Length of project may be changed.

COPY SUBMITTED TO PROGRAM ENGINEER: _____ 20 _____ Copy to:

PRIMARY HIGHWAY 99:00**SURFACING STRATEGY AND BASIC STRUCTURAL DESIGN**

Type "B" Surfacing Estimate (Based on AT 2000 Regional unit prices)

		Existing Width (m)			Final Width (m)					
Rehabilitation Overlay										
km 16.20 – km 25.135		9.0			11.8					
km 25.135 – km 33.000		9.7			14.1					
km 33.000 – km 34.20		9.4			14.1					
Item	From km	To km	Width (m)	Thickness (m)	tonnes/km	Est. Tonnes/km	Length (km)	Est. tonnes	Unit Price (\$/t)	Estimated Cost
Grade Widening										
Granular Base Course (Des. 2 Class 25)										
km 16.20 – km 19.260	16.20	19.26	5.5	0.330	4191	4200	3.06	12852		
km 19.260 – km 25.135	19.26	25.14	5.5	0.330	4191	4200	5.88	24675		
km 25.135 – km 33.00	25.14	33.00	4.7	0.280	3066	3100	7.86	24366		
km 33.00 – km 34.20	33.00	34.20	5.0	0.280	3262	3300	1.20	3960		
Inter., ent., crossovers, etc								6585		
Total tonnage (GBC – Des. 2 Cl. 25)								72438	\$11.75	\$851,150
Rehabilitation Overlay										
Asphalt Concrete Pavement (Mix Type 2 – EPS)										
km 16.20 – km 19.260	16.20	19.26	13.0	0.050	1515	1550	3.06	4743		
km 19.260 – km 25.135	19.26	25.14	13.0	0.100	3029	3050	5.88	17919		
km 25.135 – km 33.00	25.14	33.00	4.7	0.050	548	550	7.86	4323		
km 33.00 – km 34.20	33.00	34.20	5.0	0.050	583	600	1.20	720		
Inter., ent., crossovers, etc								2770		
Total tonnage (ACP – Type 2)								30475	\$35.50	\$1,081,870
Asphalt Concrete Pavement (Mix Type 8 – EPS)										
km 16.20 – km 19.260	16.20	19.26	13.0	0.020	606	650	3.06	1989		
Inter., ent., crossovers, etc								199		
Total tonnage (ACP – Type 8)								2188	\$39.00	\$85,328
Mobilization (8%)										\$161,468
Sub-Total – Construction (contract) Costs										\$2,179,817
Contingency (5%)										\$108,991
Engineering (10%)										\$228,881
Estimated Total										\$2,517,688

"B" Estimate Total (to nearest \$1000)	\$2,518,000
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**Cost Estimate "C"
For
Hwy 99:06

TENDER 9999/00**

**Prepared for
Alberta Transportation
Southern Region**

**Prepared By
ABC Consulting
Somewhere, Alberta
June 4, 2000
REVISION 3**

APPENDIX I

HIGHWAY 99:06 - Grading Estimate Summary "C"
 Highway 90 to S. of Access

Item No.	Code (CEB)	Item Description	Unit	Estimated Quantity	1999 Weighted Average	Estimated Unit Price "C"	Estimated Cost "C"	1999 AVE Cost
1	X100	Mobilization (10 %) GRADING work	lump sum	1.0			\$535,298.40	\$542,172.66
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
3	G100	Clearing	ha	1.00	\$1,750.00	\$4,000.00	\$4,000	\$1,750
4	G225	Common Excavation	m3	560000.00	\$2.10	\$2.13	\$1,192,800	\$1,176,000
5	G220	Channel Excavation	m3	3500.00	\$4.21	\$4.50	\$15,750	\$14,735
6	G230	Borrow Topsoil Excavation	m3	360000.00	\$1.58	\$1.40	\$504,000	\$568,800
7	G235	Borrow Excavation	m3	1020000.00	\$1.87	\$1.75	\$1,785,000	\$1,907,400
8	G239	Overhaul	m3.km	1720000.00	\$0.56	\$0.60	\$1,032,000	\$963,200
9	D100	Culverts - Remove and Dispose (C.S.P.) (up to 700 mm dia.)	m	183.00	\$30.00	\$28.00	\$5,124	\$5,490
10	D105	Culverts - Remove and Dispose (C.S.P.) (over 700 mm dia.)	m	44.00	\$23.00	\$35.00	\$1,540	\$1,012
11	D200	Granular Backfill - Culverts	m3	500.00	\$40.00	\$14.00	\$7,000	\$20,000
12	D410	Culverts - Supply and Install (600 mm dia. C.S.P.)	m	316.00	\$100.00	\$110.00	\$34,760	\$31,600
13	D425	Culverts - Supply and Install (800 mm dia. C.S.P.)	m	656.00	\$163.00	\$135.00	\$88,560	\$106,928
14	D540	Grouting of Abandoned Culverts	m3	37.00	\$208.00	\$250.00	\$9,250	\$7,696
15	E018	Plugging Abandoned Water Well	lump sum	1.00	\$1,000.00	\$1,500.00	\$1,500	\$1,000
16	G452	Remove and Dispose of Existing Fence	km	10.00	\$772.86	\$800.00	\$8,000	\$7,729
17	G453	Remove and Salvage of Existing Fence	km	2.50	\$965.00	\$1,000.00	\$2,500	\$2,413
18	G475	New Fence - Supply and Install - Class B	km	10.00	\$3,646.61	\$3,700.00	\$37,000	\$36,466
19	G480	New Fence - Supply and Install - Class C	km	1.00	\$5,783.33	\$7,000.00	\$7,000	\$5,783
20	G014	New Fence - Modified Class B -(Five Strand Barbwire)	km	0.20	\$5,000.00	\$5,000.00	\$1,000	\$1,000
21	G014	New Fence - Modified Class B (2.4m Post Spacing)	km	2.00	\$4,500.00	\$5,500.00	\$11,000	\$9,000
22	G018	Relocate Ranch Gate	lump sum	1.00	\$1,500.00	\$1,500.00	\$1,500	\$1,500
23	G300	Topsoil Placement	m2	750000.00	\$0.10	\$0.14	\$105,000	\$75,000
24	E600	Seeding, Fertilizing and Harrowing	ha	145.00	\$416.00	\$455.00	\$65,975	\$60,320
25	E605	Seeding, Fertilizing and Mulching	ha	12.00	\$2,700.00	\$3,500.00	\$42,000	\$32,400

APPENDIX I

26	E500	Soil Covering (Low Flow)	m2	12000.00	\$5.00	\$5.00	\$60,000	\$60,000
27	A800	Supply of Aggregate - With Option	t	800.0	\$0.95	\$0.95	\$760	\$760
36	S830	Flexible Guide Post/Delineators - Round - Supply and Install	posts	180.00	\$30.16	\$30.00	\$5,400	\$5,429
37	S825	Remove and Dispose of Existing Guardrail	m	200.00	\$6.07	\$7.00	\$1,400	\$1,214
38	S820	Remove, Salvage and Reinstall Existing Guardrail	m	840.00	\$15.45	\$17.50	\$14,700	\$12,978
39	S800	W-Beam Guardrail - Supply and Install	m	2040.00	\$40.25	\$41.00	\$83,640	\$82,110
40	S257	Supply and Install Post - 100 mm x 150 mm	posts	105.00	\$32.45	\$35.00	\$3,675	\$3,407
41	S258	Supply and Install Post - 150 mm x 200 mm	posts	12.00	\$50.00	\$60.00	\$720	\$600
42	S272	Supply of Signs, Aluminum	m2	40.00	\$188.55	\$200.00	\$8,000	\$7,542
43	S270	Supply of Signs, 3/4" Plywood	m2	14.00	\$213.35	\$220.00	\$3,080	\$2,987
44	S275	Removal and Reinstallation or Disposal of Existing Signs - One Post	signs	55.00	\$31.80	\$30.00	\$1,650	\$1,749
45	S277	Removal and Reinstallation Disposal of Existing Signs - Two Posts	signs	15.00	\$44.40	\$100.00	\$1,500	\$666
46	S283	Concrete Base - Remove and Reinstall	units	4.00	\$179.00	\$200.00	\$800	\$716
47	S291	Remove and Reinstall Breakaway Steel Posts	posts	4.00	\$97.33	\$150.00	\$600	\$389
48	S288	Install Sign - Less than 1 m2	signs	100.00	\$26.27	\$30.00	\$3,000	\$2,627
49	S289	Install Sign - 1 m2 to 3 m2	signs	15.00	\$88.72	\$120.00	\$1,800	\$1,331
58	F750	Traffic Accommodation	lump sum	1.00	\$200,000.00	\$200,000.00	\$200,000	\$200,000
				TOTAL			\$5,888,282	\$5,963,899

TOTAL ESTIMATED EXPENDITURE		\$5,888,282	\$5,963,899
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*		\$5,888,000	\$5,964,000
CONTINGENCIES @ 10%*		\$588,800	\$596,400
ENGINEERING (Total)	7.2%	\$467,100	\$467,100
UTILITIES		\$25,000	\$25,000
RIGHT-OF-WAY		\$0	\$0
GRADING ESTIMATE SUMMARY		\$6,968,900	\$7,052,500

APPENDIX I

HIGHWAY 99:06 ACP ESTIMATE SUMMARY
Highway 90 to S. of Access

Bid No.	Code (CEB)	Item Description	Unit	Estimated Quantity	1999 AVE	Estimated Unit Price "C"	Estimated Cost "C"	1999 AVE Cost
1	X100	Mobilization (10 %) ACP	lump sum	1.0			\$212,562.50	\$203,328.45
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0.00	\$0
27	A800	Supply of Aggregate - With Option	t	78000.0	\$0.95	\$0.95	\$74,100.00	\$74,100
28	Q185	Gravel Surfacing	t	10000.0	\$3.80	\$5.00	\$50,000.00	\$38,000
33	Q487	Asphalt Concrete Pavement - EPS Mix Type 1	t	67000.0	\$27.20	\$28.25	\$1,892,750.00	\$1,822,400
34	Q510	Asphalt Mix For Others	t	1000.0	\$23.40	\$24.00	\$24,000.00	\$23,400
50	S310	Pavement Message Markings - Turn Arrow (Single or Double)	units	17.0	\$41.24	\$50.00	\$850.00	\$701
51	S315	Pavement Message Markings - Stop Bar	units	4.0	\$51.55	\$75.00	\$300.00	\$206
53	S350	Roadway Lines - Supplying Paint and Painting (Directional Dividing and 2 Edge Lines)	km	23.5	\$452.11	\$500.00	\$11,750.00	\$10,625
54	S355	Roadway Lines - Supplying Paint and Painting (Lane Dividing Lines)	km	7.5	\$202.11	\$250.00	\$1,875.00	\$1,516
55	S360	Intersection Lines - Supplying Paint and Painting	intersections	2.0	\$168.39	\$250.00	\$500.00	\$337
56	X510	Cutting of Pavement Edge	m	10000.0	\$5.00	\$5.75	\$57,500.00	\$50,000
57	S052	Remove and Dispose Advance Warning Signs	units	2.0	\$6,000.00	\$6,000.00	\$12,000.00	\$12,000
				TOTAL			\$2,338,188	\$2,236,613

TOTAL ESTIMATED EXPENDITURE	\$2,338,188	\$2,236,613
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$2,338,000	\$2,237,000
CONTINGENCIES @ 10%*	\$233,800	\$223,700
ENGINEERING (Total)	\$67,431	\$67,431
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 - ACP	\$2,639,231	\$2,528,131

HIGHWAY 99:06 - GBC ESTIMATE SUMMARY
Highway 90 to S. of Access

Item No.	Code (CEB)	Item Description	Unit	Estimated Quantity	1999 AVE	Estimated Unit Price "C"	Estimated Cost "C"	1999 AVE Cost
1	X100	Mobilization (10 %) GBC	lump sum	1.0			\$138,795	112,312.96
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
27	A800	Supply of Aggregate - With Option	t	173000.0	\$0.95	\$0.95	\$164,350	\$164,350
29	B100	Subgrade Excavation	m3	500.0	\$3.92	\$4.00	\$2,000	\$1,960
30	B172	Granular Fill (Pit-run) 6 - 80	t	1000.0	\$13.33	\$14.00	\$14,000	\$13,330
31	B282	Granular Base Course 2-25	t	172000.0	\$5.30	\$6.80	\$1,169,600	\$911,600
32	Q630	Supply of Asphalt for Prime Coat	t	190.0	\$167.84	\$200.00	\$38,000	\$31,890
				TOTAL			\$1,488,745	\$1,203,553

TOTAL ESTIMATED EXPENDITURE	\$1,488,745	\$1,203,553
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$1,489,000	\$1,204,000
CONTINGENCIES @ 10%*	\$148,900	\$120,400
ENGINEERING (Total)	5.2% \$84,944	\$84,944
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
GBC ESTIMATE	\$1,722,844	\$1,409,344

APPENDIX I

HIGHWAY 99:06 CPR OVERPASS BF 99999 N and BF 99999 S ESTIMATE SUMMARY

Bid No.	Code (CEB)	Item Description	Unit	Estimated Quantity	1999 AVE	Estimated Unit Price "C"	Estimated Cost "C"	1999 AVE Cost
59	X100	Mobilization (10 %) Bridge Structures	lump sum	1.0			253,468.25	250,708.37
60	X004	Site Occupancy	per day		\$600.00	\$600.00	\$0	\$0
61	F186	Excavation - Structural	lump sum	1	\$40,000.00	\$40,000.00	\$40,000	\$40,000
62	F190	Backfill	lump sum	1	\$400,000.00	\$400,000.00	\$400,000	\$400,000
63	F812	Supply of Piling - H-Pile	m	466	\$62.89	\$65.00	\$30,290	\$29,307
64	F816	Pile Set-up	plies	28	\$1,191.24	\$1,200.00	\$33,600	\$33,355
65	F818	Pile Driving	m	466	\$4.00	\$4.00	\$1,864	\$1,864
66	F018	Mechanically Stabilized Earth Wall	lump sum	1	\$640,000.00	\$640,000.00	\$640,000	\$640,000
67	F963	Supply of Girders - Precast Long Span - DBC Type (Exterior)	girders	4	\$25,000.00	\$25,000.00	\$100,000	\$100,000
68	F963	Supply of Girders - Precast Long Span - DBC Type (Interior)	girders	18	\$25,000.00	\$25,000.00	\$450,000	\$450,000
69	F940	Delivery of Girders	lump sum	1	\$25,000.00	\$25,000.00	\$25,000	\$25,000
70	F945	Erection of Girders	lump sum	1	\$130,000.00	\$130,000.00	\$130,000	\$130,000
71	F834	Concrete - Class C	m3	191	\$619.00	\$675.00	\$128,925	\$118,229
72	F840	Concrete - Modified Class SF	m3	382	\$819.64	\$850.00	\$324,700	\$313,102
73	F850	Plain Reinforcing Steel - Supply	kg	29227	\$0.83	\$0.85	\$24,843	\$24,258
74	F852	Epoxy-coated Reinforcing Steel - Supply	kg	33188	\$1.32	\$1.35	\$44,804	\$43,808
75	F854	Reinforcing Steel - Place	kg	62415	\$0.41	\$0.45	\$28,087	\$25,590
76	F905	Supply of Bearings	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
77	F780	Bridgerail	lump sum	1	\$79,700.00	\$79,700.00	\$79,700	\$79,700
78	F020	Tube Rail Fence	m	215	\$40.00	\$40.00	\$8,600	\$8,600
79	F965	Ducts	lump sum	1	\$5,200.00	\$5,200.00	\$5,200	\$5,200
80	F970	Miscellaneous Iron	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
81	F842	Sealer	lump sum	1	\$10,000.00	\$10,000.00	\$10,000	\$10,000
81	F022	Ditch Lining	m2	800	\$2.00	\$2.00	\$1,600	\$1,600
82	F022	Sacked Concrete Drain Troughs	m	166	\$45.00	\$45.00	\$7,470	\$7,470
					TOTAL		\$2,788,151	\$2,757,792

TOTAL ESTIMATED EXPENDITURE	\$2,788,151	\$2,757,792
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$2,788,000	\$2,758,000
CONTINGENCIES @ 10%*	\$278,800	\$275,800
ENGINEERING	\$166,276	\$166,276
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 CPR OVERPASS	\$3,233,076	\$3,200,076

HWY 99:06 ACP (FINAL STAGE) ESTIMATE SUMMARY
S. of Access - N. of Anytown

Bid No.	Code (CEB)	Item Description	Unit	Estimated Quantity	1999 AVE	Estimated Unit Price "C"	Estimated Cost "C"	1999 AVE Cost
1	X100	Mobilization (10 %) ACP	lump sum	1.00			\$54,169	\$52,203
2	X004	Site Occupancy	per day		\$1,500.00	\$1,500.00	\$0	\$0
29	B100	Subgrade Excavation	m3	250.00	\$3.92	\$4.00	\$1,000	\$980
30	B172	Granular Fill (Pit-run)	t	500.00	\$13.33	\$14.00	\$7,000	\$6,665
27	A800	Agregate Supply With Option	t	17500.00	\$0.95	\$0.95	\$16,625	\$16,625
33	Q487	Asphalt Concrete Pavement - EPS Mix Type 1	t	17000.00	\$27.20	\$28.25	\$480,250	\$462,400
38	S820	Remove, Salvage and Reinstall Existing Guardrail	m	138.00	\$15.45	\$17.50	\$2,415	\$2,132
35	G270	Sideslope Improvement	km	3.00	\$9,186.15	\$9,200.00	\$27,600	\$27,558
50	S310	Pavement Message Markings - Turn Arrow (Single or Double)	units	18.0	\$41.24	\$50.00	\$900.00	\$742
52	S315	Pavement Message Markings - Stop Bar	units	6.00	\$51.55	\$75.00	\$450	\$309
52	S321	Pavement Messages - STOP	units	6.00	\$383.21	\$450.00	\$2,700	\$2,299
53	S350	Roadway Lines - Supplying Paint and Painting (Directional Dividing and 2 Edge Lines)	km	4.00	\$452.11	\$500.00	\$2,000	\$1,808
55	S360	Intersection Lines - Supplying Paint and Painting	intersections	3.00	\$168.39	\$250.00	\$750.00	\$505
				TOTAL			\$595,859	\$574,228

TOTAL ESTIMATED EXPENDITURE	\$595,859	\$574,228
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$596,000	\$574,000
CONTINGENCIES @ 10%*	\$59,600	\$57,400
ENGINEERING (Total)	\$33,311	\$33,311
UTILITIES	\$0	\$0
RIGHT-OF-WAY	\$0	\$0
TOTAL ESTIMATE HIGHWAY 99:06 - ACP - Final Stage Paving	\$688,911	\$664,711

TOTAL HIGHWAY 99:06 Cost Estimate "C" Summary

	Estimated Cost "C"	1999 AVE Cost
TOTAL ESTIMATED EXPENDITURE*	\$13,099,225	\$12,736,085
CONTRACT ESTIMATE (rounded to nearest 1000 dollars)*	\$13,099,000	\$12,737,000
CONTINGENCIES @ 10%*	\$1,309,900	\$1,273,700
ENGINEERING (Total) 6.3%	\$819,062	\$819,062
UTILITIES	\$25,000	\$25,000
RIGHT-OF-WAY	\$0	\$0
TOTAL CONTRACT ESTIMATE - ALL PHASES COMBINED	\$15,252,962	\$14,854,762

*Note: Total Estimated Expenditure values vary from individual estimate summaries due to rounding.

Prepared By: Person 1, Transportation Engineer
 Checked By: Person 2, Sr. Project Manager
 Checked By: Person 3, RET Project Manager

Date October 11, 2001

Revision 3 - Final Check Revised Costs for Engineering and Combining Quantities.

**CONTRACT ESTIMATED SUMMARY "C"
FOR TENDER 9999/00 HWY 99:06**

2000 Estimated Construction	Contract (Nearest \$1,000)	10% Contingencies	Engineering	Right of Way	Utilities	Totals
Grading	\$5,888,000	\$588,800	\$467,100	\$0	\$25,000	\$6,968,900
GBC Surfacing	\$1,489,000	\$148,900	\$84,944	\$0	\$0	\$1,722,844
ACP Surfacing	\$2,338,000	\$233,800	\$67,431	\$0	\$0	\$2,639,231
CPR Overpass	\$2,788,000	\$278,800	\$166,276	\$0	\$0	\$3,233,076
ACP - Final Stage - S. of Access	\$596,000	\$59,600	\$33,311	\$0	\$0	\$688,911
Totals	\$13,099,000	\$1,309,900	\$819,062	\$0	\$25,000	\$15,252,962
1999 Average Unit Prices Costs	Contract (Nearest \$1,000)	10% Contingencies	Engineering	Right of Way	Utilities	Totals
Grading	\$5,964,000	\$596,400	\$467,100	\$0	\$25,000	\$7,052,500
GBC Surfacing	\$1,204,000	\$120,400	\$84,944	\$0	\$0	\$1,409,344
ACP Surfacing	\$2,237,000	\$223,700	\$67,431	\$0	\$0	\$2,528,131
CPR Overpass	\$2,758,000	\$275,800	\$166,276	\$0	\$0	\$3,200,076
ACP - Final Stage - S. of Access	\$574,000	\$57,400	\$33,311	\$0	\$0	\$664,711
Totals	\$12,737,000	\$1,273,700	\$819,062	\$0	\$25,000	\$14,854,762

Notes:

1999 Average Unit Prices obtained from UNIT PRICE REPORT DATED April 12 2000

Southern Region Prices were used when available and Provincial Average Prices were used when no price for Southern Region was available.

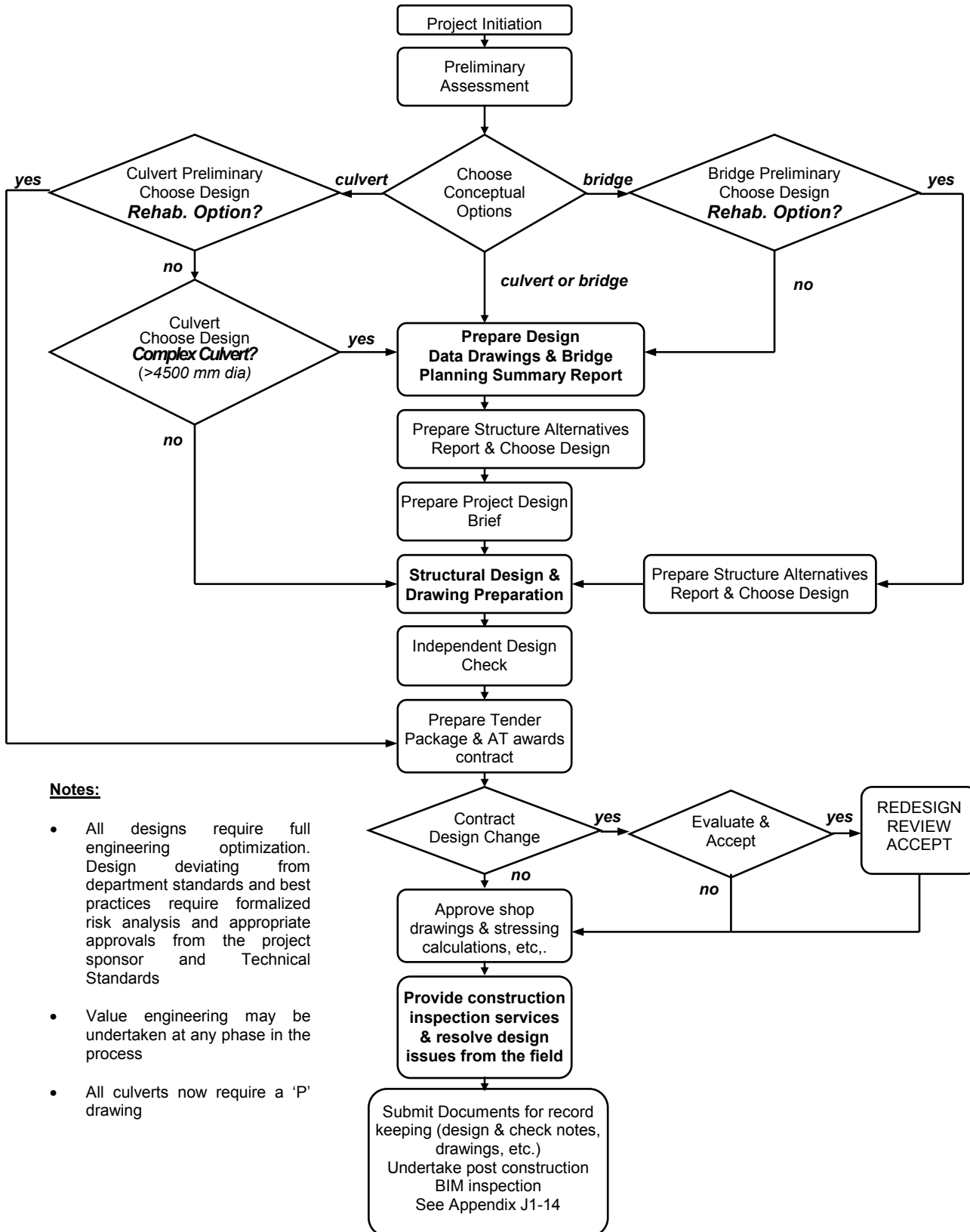
APPENDIX “J1”

BRIDGE DESIGN PROCESSES AND DATA REQUIREMENTS

APPENDIX J1

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Bridge Design Process Chart



Notes:

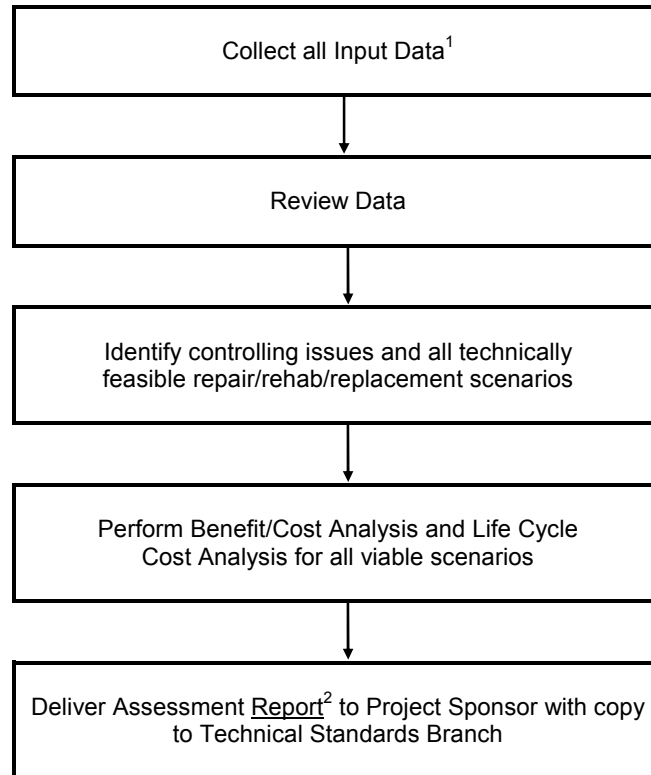
- All designs require full engineering optimization. Design deviating from department standards and best practices require formalized risk analysis and appropriate approvals from the project sponsor and Technical Standards
- Value engineering may be undertaken at any phase in the process
- All culverts now require a 'P' drawing

BRIDGE PROJECT PROCESS

No.	Activity of Design Process	Participants	Approximate Time Frame
1	Preliminary Assessment & Site History <ul style="list-style-type: none"> - Collect available information and supplement as required - Determine hydrotechnical & geometric requirements - Review project with stakeholders (road authority, railway, environment, navigable waters, canal authority, etc.) 	Consultant	2 – 4 weeks
2	Bridge Planning Concept Choice Meeting <ul style="list-style-type: none"> - Bridges, culverts or both bridges and culverts to be considered - Draft Bridge Planning Summary Report 	Region/ Technical Standards	Milestone Date (given in terms of reference of contract)
*3	Prepare Design Data Drawings & Complete Bridge Planning Summary Report	Consultant	2 to 4 weeks
*4	Review and Accept Design Data Information <ul style="list-style-type: none"> - Region and Technical Standards review information - Region completes "Preliminary Engineering (DD) Drawing Completion" form and communicates decision to consultant. 	Region/ Technical Standards	Milestone Date (given in TOR) DD drawings to be submitted 2 weeks prior to this date
5	Prepare Structure Alternatives Report	Consultant	Provide 1 week prior to (6)
6	Review Structure Alternatives Report and Select Alternative <ul style="list-style-type: none"> - Region and Technical Standards review options and recommendation - Region completes "Choose Design Completion" form and communicates decision to consultant 	Region/ Technical Standards	Milestone Date (given in TOR)
7	Obtain Required Approvals <ul style="list-style-type: none"> - Consultant prepares all documents and submits to Region - Region or consultant makes formal submissions to NTA, NWPA, Environment, etc. for approval 	Consultant/Region	As required to meet construction tender contract dates
*8	Prepare Project Design Brief	Consultant	1 week and submit 1 week prior to (10)
*9	Review and Accept Project Design Brief & Communicate decision to consultant	Region/ Technical Standards	Milestone Date (given in TOR)
10	Detailed Structural Design Package <ul style="list-style-type: none"> - Prepare contract drawings ** - Independent check of design and drawings - Prepare special provisions - Assemble tender documents ** All culverts now require a 'P' drawing	Consultant	4 to 15 weeks Package to be submitted 2 weeks prior to (11)
11	Review and Accept Tender Package <ul style="list-style-type: none"> - Region, Technical Standards and Contracts review tender package - Region accepts tender package, completes "Design Completion" form and communicates decision to consultant 	Region/ Technical Stds./Programming	Milestone Date (given in TOR)
12	Provide Design Services during Construction <ul style="list-style-type: none"> - Approve shop or fabrication drawings, erection drawings and stressing calculations - Respond to queries from field related to design 	Consultant	As specified in Terms of Reference
13	Prepare As-Constructed Drawings <ul style="list-style-type: none"> - Undertake post construction BIM inspection 	Consultant Consultant/Region	4 weeks after open to traffic date
14	File Documents <ul style="list-style-type: none"> - As-constructed drawings, shop drawings, special provisions, designers notes, checkers notes etc. - Submit completed "Corporate Data Requirements" forms 	Technical Standards Region	8 weeks maximum after open to traffic date
15	Evaluate Consultant <ul style="list-style-type: none"> - Communicate Results to Technical Standards 	Region/Consultant	4 weeks after completion date

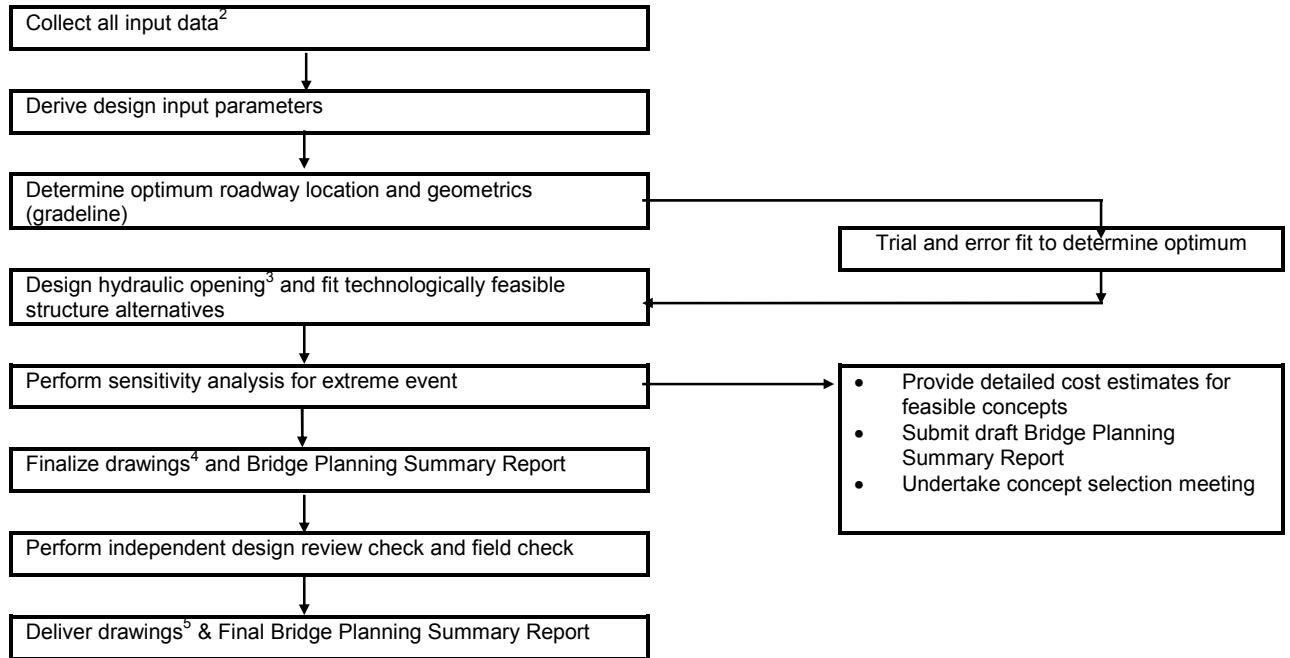
* Major Bridges Only

BRIDGE ASSESSMENT



¹ Input Data includes:	² Report Contents includes:
<ul style="list-style-type: none"> • Site hydraulics & hydrology, floods, scour, drift • Geotechnical observation • Environmental • Corrosion data • Structural condition & load rating (BIM) • Air photos • Site History including accidents, maintenance • Site inspection • Traffic count & proportion of trucks • Planned development • Land use • Train traffic • Existing drawings • Geometrics • Clearances • Current and future roadway design standard • Traffic accommodation • Review of structures up & down stream 	<ul style="list-style-type: none"> • Introduction - who initiated study and why? • Site location, map and air photo • Recent BIM Inspection • Site history including all pertinent data • Discussion of all controlling issues • Analysis of hydrotechnical issues • Traffic count & Roadway System Analysis (maps, future plans etc.) • Geometrics • Design standards • Future development • Analysis of existing structure • Summarization of all technically feasible repair/rehabilitation/replacement scenarios with associated net present value • Recommendation on selected repair/rehabilitation/replacement option

PREPARATION OF DESIGN DATA DRAWINGS¹ & BRIDGE PLANNING SUMMARY REPORT



¹ Required for all major bridges as defined by SAD <ul style="list-style-type: none"> • Required for all complex culverts • Required for all stream improvements or major restoration of stream training works 	³ If both culverts & bridges are technologically feasible, the design parameters for both are to be included on the drawing
² All data required for a bridge assessment. plus: <ul style="list-style-type: none"> • Site survey • Geotechnical testholes • Detailed hydrotechnical design parameters • Decision for navigability & Fisheries • Site mosaic • Utility locations 	⁴ Department will issue drawing number ⁵ Deliverables: <ul style="list-style-type: none"> • Bridge Planning Summary Repot • Air Photos • Signed mylars • Design notes • Permits • Electronic design files • DD meeting sheet

REQUIREMENTS FOR DESIGN DATA DRAWINGS

WORK TASKS

- ◆ Undertake an initial site assessment in order to highlight significant issues. Conduct a cost benefit or life cycle cost analysis involving any components can be reused during reconstruction. If necessary, co-ordinate preliminary design with concurrent geometric design and/or location study, and local road authority. Submit Decision for Navigability request.
- ◆ Undertake site survey and geotechnical investigation as necessary. Complete location optimization, geometric design and hydraulic analysis, consideration of alternative structure types to allow development of alternative and ultimate finalization of optimum planning design to be shown on Design Data drawings and structural design. Complete draft Bridge Planning Summary Report and facilitate choose concept meeting.
- ◆ Prepare Design Data drawings containing sufficient detail and information to allow the construction of the bridge head slopes and fills, any river training works and/or protection works and temporary traffic accommodation during construction. Design Data drawings are to include but are not necessarily restricted to the items detailed in the following sections. Sample drawings will be provided upon request to Edmonton office.
- ◆ Detailed site plan showing:
 - location of the as-built bridge relative to the stream
 - all existing or proposed river training and/or bank protection works
 - all utilities, existing and required right-of-way and any existing developments
 - detour alignment which meets or exceeds minimum standards
- ◆ Elevation view showing:
 - existing bridge including abutments, piers and foundation
 - location of the bridge head slopes
 - any protection works relative to the river banks
 - design hydraulic conditions including:
 - design high water elevation
 - high water elevations with date of measurement
 - minimum freeboard (as per SAD guidelines)
 - design ice conditions
 - anticipated scour
 - proposed deck elevation
 - geotechnical information including test holes or test piles
- ◆ Bridge cross-section showing minimum proposed clear deck width, lane configurations and crown or superelevation
- ◆ Cross section of roadway approach fills at bridge ends.

- ◆ Site mosaic showing:
 - proposed bridge
 - stream
 - extent of fills
 - river training and/or protection works
 - existing roadway system including horizontal curve data and how the replacement bridge will tie in
 - land ownership
- ◆ Stream bed and water or ice surface profile.
- ◆ Highway profile showing:
 - station and elevation of:
 - vertical curves with associated “K” values and slope
 - proposed abutments
- ◆ General Summary notes including:
 - survey acquisition information
 - hydrotechnical summary giving:
 - drainage area
 - design discharge and return frequency
 - historical high flood
 - mean flow velocity for design discharge through the proposed bridge opening
 - flowing ice condition with situation and elevation
 - stream bed slope
 - anticipated backwater due to proposed bridge
 - type, specification and quantities of any bridge and/or bank protection material
 - all other relevant notes required to structurally design, construct and operate the bridge
 - highway geometric design standards
- ◆ Prepare Navigable Waters sketches (if required).
- ◆ Fish Compensation plans when required
- ◆ Obtain all necessary permits, licenses or approvals, prepare special provisions and submissions for Water Resources Permit, Federal Fisheries, and/or Navigable Waters Protection Act approval.
- ◆ Submit Bridge Planning Summary Report.

PROCESS MILESTONES

- ◆ At an agreed upon time after proposal acceptance, attend initial meeting with Municipality to identify alignment, location and structure type alternatives and discuss site-specific issues.

- ◆ Prepare alternatives for advancement to Design Data drawing stage.
- ◆ Submit concept alternatives and draft Bridge Planning Summary Report.
- ◆ Attend meeting to review initial design including hydrotechnical and geometric aspects.
- ◆ Prepare final Design Data drawings in preparation for formal Design Data drawing review with Municipality. A complete check of the design and drawings by an engineer other than that responsible for the design is required. Copies of these drawings are to be supplied to Municipality two weeks prior to the “Design Data Drawing” meeting.
- ◆ Attend meeting for final review and acceptance of Design Data drawings.

Obtain permits and approvals to satisfy requirements.

Bridge File: _____

Region: _____

Project Description: _____ Highway: _____ Road Authority: _____

Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____

Consultant: _____ Project Manager: _____ CE Agreement: _____

ASSESSMENT ALTERNATIVES:				
	Description	Selected	Cost Estimate	NPV (50 years, 4%)
1.				
2.				
3.				
4.				
5.				
6.				

SPECIAL CONSIDERATIONS:	
Notes:	

SELECTED ALTERNATIVE:	
Description:	
Rationale:	
Notes:	

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

	<u>Cost Estimate</u>	<u>Type</u>	<u>Date</u>
Current:	_____	_____	_____
Previous:	_____	_____	_____
Includes:	Engineering, Construction, Contingencies, R/W, Detour		

	<u>Milestone Schedule</u>	<u>Date</u>
Complete preliminary engineering:	_____	_____
Choose Design:	_____	_____
Complete detailed design:	_____	_____
Tender ready for advertising:	_____	_____

Consultant Project Manager's Signature	Dept. Administrator's Signature	Dept. Sponsor's Signature

Copies to: Consultant, TSB, Bridge File

Bridge File: _____

Region: _____

Project Description: _____ Highway: _____ Road Authority: _____

Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____

Consultant: _____ Project Manager: _____ CE Agreement: _____

DESIGN INFORMATION:				
Clear Roadway:		Skew		Sidewalk:
Length (O.T.O. fills)		Min. Center Span:		
Top of Deck to Streambed:		Minimum Horz, Clearance Under:		Min. Clearance to Bottom Flange:
Culvert Size (span x rise x length) and Shape:				
Streambed Width:		Stream slope:		
Drainage Area:		Des. Return Period:		Design Flow:
Des. Flow Depth:		Des. Freeboard:		Des. Head Loss:
Design Velocity:		Drift/Debris:		
Ice Situation:		Des. Ice Thickness:		Des. ice Elevation:
River Training		Bank Protection:		Stream Improvement
Geotechnical Info:				Corrosion Data:
Road Standard:		Road Improvements:		
Vert. Alignment:		Horz. Alignment:		Max. Grade on Deck:
Max. Grade on Road:		Ditch Drainage:		
NOTES:				
DD/N Drawing No's:				

APPROVALS/PERMITS:				
	REQUIRED	APPLICATION DATE	DATE ISSUED	NUMBER
Alberta Environment Protection (Water Act)				
Coast Guard Canada (NWPA)				
Fisheries and Oceans Canada				
Canadian Transportation Agency				

RIGHT OF WAY/EASEMENTS:

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

<u>Cost Estimate</u>	<u>Milestone Schedule</u>
<u>Type</u>	<u>Date</u>
Current: _____	Choose Design: _____
Previous: _____	Project Design Brief: _____
Includes: <u>Engineering, Construction, Contingencies, R/W, Detour</u>	Complete detailed design: _____
	Tender ready for advertising: _____

_____ Consultant Project Manager's Signature	_____ Dept. Administrator's Signature	_____ Dept. Sponsor's Signature
---	--	------------------------------------

Copies to: Consultant, TSB, Bridge File

Bridge File: _____
 Region: _____
 Project Description: _____ Highway: _____ Road Authority: _____
 Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____
 Consultant: _____ Project Manager: _____ CE Agreement: _____

CLEAR ROADWAY WIDTH: _____	AREA (O.T.O. fills and total bridge width) : _____
----------------------------	--

STRUCTURE ALTERNATIVES				
	Description	Selected	Cost Estimate	NPV (50 Years, 4%)
1.				
2.				
3.				
4.				

SPECIAL CONSIDERATIONS:	
Notes:	

SELECTED ALTERNATIVE:			
Girder Type, Size and No. of Lines:			
Culvert Size (span x rise x length) and Shape:			
Abutment Type:		Pier Type:	
Deck and Wearing Surface Type:			
Deck Joints:			
Curbs:		Bridge Rail:	
Approach Slabs:		Guardrail:	
Notes:			
DD Drawing No.'s:			

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

<u>Cost Estimate</u>	<u>Type</u>	<u>Date</u>	<u>Milestone Schedule</u>	<u>Date</u>
Current:			Project Design Brief:	
Previous:			Complete detailed design:	
Includes: Engineering, Construction, Contingencies, R/W, Detour			Tender ready for advertising:	
			Tender advertize date:	

 Consultant Project Manager's Signature Dept. Administrator's Signature Dept. Sponsor's Signature

Copies to: Consultant, TSB, Bridge File

Bridge File: _____
 Region: _____
 Project Description: _____ Highway: _____ Road Authority: _____
 Dept. Sponsor: _____ Dept. Admin: _____ TSB Liaison: _____
 Consultant: _____ Project Manager: _____ CE Agreement: _____

DESIGN INFORMATION:			
Clear Roadway:		Total Width:	
Deck Length:		Net Deck Area:	
Design Loading:			
Girder Type, Size and No. of Lines:			
Culvert Size (span x rise x length) and shape:			
Abutment Type:		Pier Type:	
Bearing Types:			
Deck and Wearing Surface Type:			
Deck Joints:			
Curbs:		Bridge Rail:	
Approach Slabs:		Deck Drainage:	
Approach Surface:		Guardrail:	
Utility Accommodations:		Traffic:	
Disposal of Salvage:			
NOTES:			
DD Drawing No.'s:			
P Drawing Numbers:		Sign Date:	

APPROVALS/PERMITS:				
	REQUIRED	APPLICATION DATE	DATE ISSUED	NUMBER
Alberta Environment Protection (Water Act)				
Coast Guard Canada (NWPA)				
Fisheries and Oceans Canada				
Canadian Transportation Agency				

RIGHT OF WAY/EASEMENTS:	
--------------------------------	--

Draft Submission: _____ Review Meeting Date: _____ Final Submission: _____

	<u>Cost Estimate</u>	<u>Type</u>	<u>Date</u>
Current:	_____	_____	_____
Previous:	_____	_____	_____
Includes:	Engineering, Construction, Contingencies, R/W, Detour		

	<u>Milestone Schedule</u>	<u>Date</u>
Tender ready for advertising:	_____	_____
Tender advertise date:	_____	_____
Completion construction:	_____	_____

_____	_____	_____
Consultant Project Manager's Signature	Dept. Administrator's Signature	Dept. Sponsor's Signature

Copies to: Consultant, TSB, Bridge File

File No.: _____
Page No.: _____
Date : _____

Engineer/Company : _____

DESIGN PROJECT BRIEF

PROPOSED TITLE BLOCK

Design Codes: : _____
Other References: _____
DD No. _____
Choose Design Record: _____
Latest Cost Estimate: _____

Project Scope & Short Description of Structure:

ITEM	REV	DESCRIPTION
Geometry		Spans: Horizontal Alignment: Vertical Alignment: Graseline: Skew: Lane Widths & Clear Roadway: Offset from Hwy Centreline: Clearance Box: Future Requirements: Additional Comments:

Engineer/Company : _____

ITEM	REV	DESCRIPTION
Design Parameters		Live Load: Fatigue Stress Cycles: Wind Load: Temperature Range: Earth Pressures: Ice Loads: Earthquake: Test Piles: Soil Bore Hole Data: Geotechnical Features:
Structural Materials		As per Std Dwgs: Concrete: 25 MPa Class A: 25 “ Class B: 30 “ Class C: 30 “ Class D: Pipe Pile: Epoxy Coated Rebar: Reinforcing Steel: (Grade 400) Prestressing Steel: Post-Tensioning Steel: Structural Steel: Other Materials:

Engineer/Company : _____

ITEM	REV	DESCRIPTION
Abutments		Type: Piles: Foundation: Backwall: Wingwalls: Curtain Wall: Roof Slab: Approach Slab: Finishes & Sealing: Slope Protection: Drain Troughs: Special Features:
Piers		Type: Foundation: Footing Elevations: Footing Shape: Bracing: Nose Plates: Paint Colour: Finishes: Special Features:
Bearings		Type:

Engineer/Company : _____

ITEM	REV	DESCRIPTION
		Expansion: Fixed: Orientation W.R.T. Skew: Additional Comments:
Girders		Method of Analysis: Girder Type: Number & Spacing: Continuity: Transverse Connectivity: Wheel Line Distribution: Diaphragms: Paint Colour: Additional Comments:
Deck		Nominal Thickness:

Engineer/Company : _____

ITEM	REV	DESCRIPTION
		Haunches: Crown or Superelevation: Waterproofing System: Wearing Surface: (Current & Future) Curbs: Sidewalks: Railings: Median: Deck Drains: Utilities: Deck Joints: (Location & type) Special Features:
Construction Features:		Remarks on how the major project elements will be built (contract; crew; etc.) Other factors to consider: Detours; channel/road work; staging; field vs plant work; drainage; lighting; other agency involvements. Generally, only unusual situations or non-standard procedures need be listed.
Preliminary List		Drawing No. Drawing Title

File No.: _____
 Page No.: _____
 Date : _____

Engineer/Company : _____

ITEM	REV	DESCRIPTION
of Drawings:		

File No.: _____
 Page No.: _____
 Date : _____

Engineer/Company : _____

ITEM	REV	DESCRIPTION
<p>Scheduling:</p>		<p>Provide realistic estimates of completion of design and drafting work considering current knowledge of drafting support level.</p>
<p>Unresolved Major Items:</p>		<p>List items for further review, investigation decision, missing data, etc.</p>

**CORPORATE DATA REQUIREMENTS FOR BRIDGE PROJECTS
PROJECT SUMMARY**

Municipality:		
Bridge File:	Agreement #	Department Liaison
Project Description:		
Region:	Location:	
Consultant:		
Project start date:	Project completion date:	

STRUCTURAL AND HYDROTECHNICAL DELIVERABLES

PRELIMINARY ENGINEERING	date required**	date delivered	forwarded to Edmonton?
• Bridge Assessment Report			
• Cost Estimates (B1)			
• Environment Permit			
• Federal Fisheries Approval			
• NWPA Decision			
• NWPA Approval			
• Preliminary Engineering Meeting Form			
• CTA Approval (Railways)			
• Geotechnical Report			
• Corrosion Survey Report			
• Complete Design Notes & Checkers Notes			
• DD Drawings: signed & stamped Mylar + CAD Files			
• Drawing Numbers			
	DD		

DETAILED DESIGN	date required	date delivered	forwarded to Edmonton?
• Preliminary Structures Report			
• Choose Design Form			
• Project Design Brief			
• Culvert or Bridge Authorization Form			
• Design Completion Form			
• Cost Estimate (c)			
• Approved Shop/fabrication Drawings + CAD Files			
• Approved Stressing Calculations			
• Const. Drawings: signed & stamped Mylar + CAD Files			
• Design Notes and Checkers Notes			
• Drawing Number Range			
	P		

for additional information see clause of the "Engineering Consultant Guidelines for Highway & Bridge Projects"

****Department Liaison to indicate N/A in box when "not applicable"**

CC: Department Liaison Director, Bridge Engineering Section, Edmonton

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APPENDIX “J2”

QUALIFICATIONS FOR BRIDGE MATERIALS FABRICATION INSPECTION

**PRE-STRESSED PRE-CAST CONCRETE
GIRDER/UNITS**

**MISCELLANEOUS MATERIAL (INCLUDING
CULVERTS)**

MAJOR STEEL COMPONENTS

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APPENDIX "J2"**BRIDGE MATERIALS FABRICATION INSPECTION****Prestressed Precast Concrete Girders/Units**

QUALIFICATIONS

- Inspector
ACI grade 1 certified concrete testing technician and must have extensive precast prestressed concrete fabrication experience. He shall be fully cognizant of all requirements of the Contract, Specifications and Drawings.
- Testing Lab
Certified to CSA standards.

Miscellaneous Material Including Culverts

Miscellaneous material includes deck joints, bearings, bridgerail, strengthening/replacement members, miscellaneous iron and culverts.

QUALIFICATIONS OF VISUAL INSPECTOR

- The visual inspector shall be a Level II certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have bridge related fabrication inspection experience. He shall be fully cognizant of all requirements of the Contract, Specifications and Drawings.

QUALIFICATIONS OF NDT INSPECTORS

- **Radiographic Inspection:** The lead technician shall be certified to Level II of C.G.S.B. and his assistant shall be a Qualified Operator (Q.O.).
- **Ultrasonic Inspection:** The technician shall be certified to Level II of C.G.S.B.
- **Magnetic Particle Inspection:** The technician shall be certified to Level II of C.G.S.B.

Major Steel Components

Major steel components include steel girders, sign structures and ferries.

QUALIFICATIONS OF VISUAL INSPECTOR/S

- The day shift visual inspector shall be a Level III certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have an extensive bridge related fabrication inspection experience. He must also be experienced in operating telebrinell hardness testing apparatus. He shall be fully cognizant of all requirements of the Contract, Specifications and Drawings.

- The second shift visual inspector shall be a Level II certified welding inspector as per CSA 178.2 accredited with W47.1/W59 or must have bridge related fabrication inspection experience. He shall be experienced in interpreting Engineering Drawings.

QUALIFICATIONS OF NDT INSPECTORS

- Radiographic Inspection: The lead technician shall be certified to Level II of C.G.S.B. and his assistant shall be a Qualified Operator (Q.O.).
- Magnetic Particle Inspection: The technician shall be certified to Level II of C.G.S.B.
- Ultrasonic Inspection: The technician shall be certified to Level II of C.G.S.B.

APPENDIX “J3”

QUALIFICATIONS FOR BRIDGE CONSTRUCTION INSPECTION AND BRIDGE PAINTING INSPECTION

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APPENDIX "J3"

BRIDGE CONSTRUCTION INSPECTION

GENERAL

- Bridge Construction Inspection shall include inspection for major bridge structures, bridge rehabilitation work and bridge size culverts.

QUALIFICATIONS OF BRIDGE CONSTRUCTION INSPECTOR

- Preference for either a Civil Engineer, P. Eng. or Certified Civil Engineering Technologist (C.E.T.).
- Extensive field experience in supervision and inspection of bridge construction/bridge rehab work by contract.
- Trained and experienced in interpreting engineering drawings.
- Effective written and oral communication skills.
- Previous field experience in construction surveying, concrete quality control, rebar installations and concrete placement.
- Thorough knowledge of contract administration and contract law.
- Competent and knowledgeable of the Occupational Health and Safety Act and Regulations.

BRIDGE PAINTING INSPECTION

GENERAL

- Bridge Painting Inspection shall be inspection of bridge structures requiring the application of an approved coating system.

QUALIFICATIONS OF PAINT INSPECTOR

- The Paint Inspector shall have N.A.C.E. (National Association of Corrosion Engineers) Level III certification.

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APPENDIX “K”

RECORDS MANAGEMENT BY CONSULTANTS ON PROJECTS

APPENDIX K

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RECORDS MANAGEMENT BY CONSULTANTS ON PROJECTS

To ensure that sufficiently detailed records are kept to comply with the requirements of the Freedom of Information and Protection of Privacy (FOIP) Act, and to serve the future needs of the Department, the following records must be prepared, submitted, and a copy retained by the Consultant. The records are listed in categories as follows:

- 1) Planning
- 2) Roadway Design
 - 2a) Preliminary Survey
 - 2b) Grading Design
 - 2c) Environment
 - 2d) Utilities
 - 2e) Lands and Aggregates
 - 2f) Geotechnical
 - 2g) Surfacing
 - 2h) Traffic
- 3) Bridges
 - 3a) Bridge Preliminary Engineering
 - 3b) Bridge Design

The bridge related information (listed as items 3a and 3b above) shall be submitted based on bridge file number to facilitate record retention under those file numbers. The rest of the information shall be submitted as one Project Records file with the information categorised according to the headings shown. The Project Records file will be stored in the Corporate Records Centre under the following identifiers: Highway Number, Control Section Number and Kilometre "from and to" information (project limits). Supplemental information that will also be shown on the file identifier are dates, project description "from and to", Contract Number (for construction contract) and Agreement Number (for engineering agreement). The Department will store the graphics information separately from the Project Records file e.g. mosaic-profile plans, bridge plans, etc. will be stored in the appropriate graphics files.

Electronic files for all text and graphics shall be included. **The Project Records file shall be submitted prior to final invoice submission for engineering services on a project.**

Consultants are required to prepare a complete duplicate copy of the Project Records file. At the time of writing, a Record Retention and Depositions Schedule for Consultant is under development. Currently there is no retention period specified for Consultants. However, it is expected that the practice will be similar to the Department's current practice for records retention and deposition. The Department's practice is documented in Schedule number 1994/059-A3 which is available from Records Management Section, Alberta Transportation, 4999 98 avenue, Edmonton.

Note: *An asterisk (*) beside a plan or record indicates that an "As-Constructed" plan is to be submitted following completion of construction. All "As-Constructed" plans shall be submitted in microstation .dgn format and on 3 mil mylar, stamped, signed and sealed, along with a CD containing the "As-Constructed" electronic CAD drawings as part of the Final Details for a project. Final details shall be submitted prior to final invoice submission for engineering services on a project.*

1. PLANNING

- A written reproducible (unbound, camera ready, 8" x 11" or on mylar film) report (complete with plans) is required. All electronic data, for example survey data, digital files for photo image, digital file for interchange or intersection plans, etc. shall also be submitted for department use.
- Public participation documents i.e. questionnaires bound separately. The intention is to enable the Department to protect the privacy of the individual as per FOIP.

2. ROADWAY DESIGN

- A CD containing all electronic files of the design categories below (from 2a to 2h), clearly labelled, shall be submitted to the Project Sponsor prior to final invoice submission for engineering services on a project.

2a) PRELIMINARY SURVEY

- An ASCII geographic coordinate file (xyz values such as latitude, longitude, elevation) for roads and bridges site surveys including raw and processed data of survey, geodetic datum and other survey specifics.
- Utilities Survey
 - Exact location and depth of installation of telephone cable (size and type) and pedestals, overhead telephone lines, power lines, television, telecommunication, pipeline company instrumentation, pipelines, telegraph, railway operating cables, etc. shall be noted in the survey field book.
- Railway Crossings
 - The complete details of survey and all plans prepared for railway crossings

2b) GRADING DESIGN

- Geometric, Safety, and Surfacing Assessment Reports (when prepared by the Roadway Design Consultant)
- Find Grading Design Package (as noted in Section 8.1.1) including "As-Tendered" mosaic profile plans, intersection plans, utility plans, overhaul diagram, and other special drawings
- A zipped file of computer aided Detailed Design of the entire project including road allowances, roadside turnouts, accesses and service roads

NOTE: The database should be ready for loading in the program software to

print design information as well as to view the Design Cross Sections, Earthwork Quantities, and Overhaul Diagrams

- Design Element Files
 - horizontal and vertical alignments
 - typical cross-sections
 - superelevation
 - climbing/passing lanes
 - soil survey information (i.e. borings file)
 - area/surface parameters
 - borrow files
 - volume files
- *As-Constructed* mosaic profile plans
- *As-Constructed* plans for intersection geometric layout, passing lanes, climbing lanes, interchange, roadside turnouts, etc.

2c) ENVIRONMENT

- Approvals issued by Alberta Environmental Protection need to be retained until a reclamation certificate is obtained for borrow pits and gravel pits
- Permits and licences issued by Environmental Protection may need periodic re-authorisation
- Letters of clearance issued by Alberta Community Development for archaeological sites, etc.
- Terms and conditions from referrals

2d) UTILITIES

- *Utility crossing plans and associated crossing agreements (plan to be retained with Finals)
- Utility alteration estimates, where applicable
- Correspondence with utilities companies

2e) LAND AND AGGREGATES

- Aggregate data summary requests
- Spec. shell (supply and payment for aggregate - contractor's supply with option)
- *Pit operations

APPENDIX K

- *Pit plan
- *Aggregates testing plan
- Area map showing project and aggregate site
- Mosaic of right-of-way request

2f) GEOTECHNICAL

- Geotechnical engineering report (complete with investigation report, borehole logs, plans, drawings, recommendations)
- Computer diskettes containing instrumentation monitoring readings and files of plots
- Computer printout of instrumentation monitoring plots

2g) SURFACING DESIGN

- Surfacing strategy and basic structural design report
- Contract document
- Bid items description
- Quantity, cost estimates, and summaries
- Cross sections and plans
- Design notes and correspondence

2h) TRAFFIC

- Traffic and Pedestrian Control Signals
 - Traffic data (if these are provided by the consultant)
 - Signal design (phasing, timing, etc.)
 - *Intersection layout (signal design)
 - Signal equipment (electrical prints, operation manuals, brochures, etc.)
- Railway Crossing Signals
 - *Crossing plan
 - Application documents with Transport Canada, etc.
 - Board Orders and cost sharing agreements
- Traffic Studies
 - Proposals
 - Study Report
- Signing, Pavement Markings, and Guardrail Design

- Project plans where necessary
- Illumination
 - *Lighting design (plans, etc.)
 - Agreements with power company (operation and maintenance responsibility)

3. BRIDGES

3a) BRIDGE PRELIMINARY ENGINEERING

- Bridge assessment report
- Plans and cost estimate for alternatives considered
- Navigable Water Protection Act (NWPA) drawings and permit applications/approvals
- Railway grade separation design plan including Canada Transportation Act (CTA) submission
- Drawings
- Environmental Impact Assessment and all documentation required for CTA approval
- Environmental permit documents
- Estimated life expectancy of culvert and corrosion survey results
- Design notes
- *Stamped, signed and sealed original Design Data (DD) drawings (hard copy & electronic data)
- CTA order, and approval drawing(s)

3b) BRIDGE DESIGN

- *Original drawing (with stamps and signatures)(hard copy & electronic data)
- Design notes
- Shop drawings
- Project summary report
- Copy project related photographs

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APPENDIX “L”

SUMMARY TABLES OF COMMONLY USED FORMS

APPENDIX L

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**ACCIDENT NOTIFICATION
INCIDENT REPORT INVOLVING
THIRD PARTY AND/OR CONTRACTOR'S EQUIPMENT**

DATE OF ACCIDENT: _____ TIME: _____ TM am TM pm

HWY. NO. _____ LOCATION _____

CONSTRUCTION ZONE ^{YES} ^{NO} TM TM MAINTENANCE ZONE ^{YES} ^{NO} TM TM OTHER: _____

IS HIGHWAY CLOSED ^{YES} ^{NO} TM TM TRAFFIC RESTRICTED ^{YES} ^{NO} TM TM
OTHER: _____

WEATHER CONDITIONS: _____ ROAD CONDITIONS _____

ACCIDENT CAUSE: REAREND ^{YES} ^{NO} TM TM SIDESWIPE ^{YES} ^{NO} TM TM HEAD-ON ^{YES} ^{NO} TM TM
OTHER _____

POLICE CONTACTED ^{YES} ^{NO} TM TM DETACHMENT _____ FILE # _____

CONTRACTOR'S NAME: _____ CONTRACT # _____

THIRD PARTY: _____

INJURIES (PLEASE CIRCLE ONE):

CONTRACTOR: NONE - MINOR - SERIOUS - FATAL THIRD PARTY: NONE - MINOR - SERIOUS - FATAL

BRIEF

DESCRIPTION: _____

INFORMATION REPORTED BY: _____ DATE: _____

FORM COMPLETED BY: _____ PHONE NO. _____


IS FOLLOW UP REQUIRED BY THE DEPARTMENT? ^{YES} ^{NO} TM TM IF SO BY WHOM:

CONTACT NAME _____ PHONE NO. _____

FAXED TO: Safety Officer 403/382-4412 TM

SAFETY OFFICER FAX TO:

R. Penny, ADM 780/422-6515 TM

	<h2 style="margin: 0;">UTILITY ACCIDENT REPORT</h2>							
To: Project Sponsor, Region: _____	From: Consultant: _____ Telephone No: _____ Fax No: _____ Contract No: _____							
Date of Accident <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th style="width: 10%;">D</th> <th style="width: 10%;">M</th> <th style="width: 10%;">Y</th> </tr> <tr> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> <td style="height: 20px;"> </td> </tr> </table>	D	M	Y				Time (Use 24:00 Hr) _____	<input type="checkbox"/> For your information and records <input type="checkbox"/> For claims investigation <input type="checkbox"/> Others (Explain) _____
D	M	Y						
Project: _____ Description: _____ Station: _____ Offset: _____ Legal Description: 1/4 Sec. _____ TWP. _____ RGE. _____ W. _____ M.								
Contractor Name: _____ Phone No: _____ Equipment Used During Accident: _____ Government or Hired Equipment: _____ Unit No: _____ Operator Name: _____ Phone No: _____								
Utility Company: _____ Contact: _____ Type of Utility: <input type="checkbox"/> Pipeline Size: _____ Commodity: _____ <input type="checkbox"/> Powerline <input type="checkbox"/> Tel. Cable <input type="checkbox"/> TV Cable <input type="checkbox"/> Others (Explain) _____								
Was utility locate requested? <input type="checkbox"/> Yes <input type="checkbox"/> No If "Yes" <input type="checkbox"/> Requested through Alberta 1st. call Reg. No: _____ <input type="checkbox"/> Requested through utility owner Date (d,m,y): _____ If "No" (Explain) _____								
Severity of Accident: <input type="checkbox"/> Fatal <input type="checkbox"/> Injury <input type="checkbox"/> Property Damage								
Brief Description of Injury								
Name: _____ Name: _____ Employer: _____ Employer: _____ Injury: _____ Injury: _____								

Office of the Regional Director

_____, 2002

NAME OF FIRM

RE: ATV'S USE FOR FIELD SURVEYS

Thank you for your letter dated _____, 2001, requesting approval for your firm to use ATV's to conduct Field Surveys for Engineering purposes.

Enclosed is the Order authorizing your firm to use the highway right-of-way (off highway surface) during the daylight hours only.

Please contact the appropriate RCMP Detachments along the route regarding your activities.

While permission is granted, it must be understood that neither this department nor the government will accept any responsibility or liability for anything that may occur as a result. Please be sure to remind the firm employees to obey all applicable traffic laws and urge them to use the utmost caution at all times. As well, the ATV operator must have a valid Operator's License.

Sincerely,

Regional Director

Attachment (Order and Guidelines)

**GOVERNMENT OF ALBERTA
DEPARTMENT OF TRANSPORTATION
ALL - TERRAIN VEHICLES ORDER**

I, _____, *Regional Director of Transportation*, pursuant to
Section 18(2) of the *Off-Highway Vehicle Act*, make the following Order, being the
_____ Order.

_____ are authorized to permit ATV's between _____
within the highway right-of-way, but not on the travelled portion of Highway during the period
from _____ to _____. This use is restricted to undertake
engineering work and the attached Guidelines form a condition of this permit.

DATED at _____, Alberta this _____ day of _____, 1998.

*Regional Director of
Transportation*



September 25, 1998

TO ALL CONSULTANTS

Dear Sir/Madam:

Previously you had received the Request for Corporate Information and we are now making a change to the procedure due to operational concerns. Effective October 1, 1998 we are implementing a new procedure for requests of department files by consultants.

Enclosed herewith for your use are the following:

1. Procedures to complete Request for Corporate Information (1 page)
2. Blank Request for Corporation Information form for your use (1 page)

This request form is for the viewing of files and drawings only and it should be faxed to the Corporate Records Centre at (403) 427-3905. **If you need only drawings for roads and bridges please fax Terry Gullekson at (403) 422-2846. If you have a question Terry's telephone number is (403) 415-1026.**

This is Release 2 of this form and new procedure; your comments as to improvements or enhancements are encouraged, please address them directly to Sheryn Thompson, Corporate Records Centre at (403) 427-0040 or email at sthompson@tu.gov.ab.ca.

Yours truly,

*Original signed by Allan Kwan
September 25, 1998*

Allan Kwan, P. Eng.
Executive Director
Technical Standards Branch

*Original signed by Andy Cathcart
September 25, 1998*

Andy Cathcart
Head, Process Information Management
Information Management Branch

cc: Allan Humphreys
Regional Construction Managers
Regional Bridge Managers



REQUEST FOR CORPORATE INFORMATION

PROJECT SPONSOR:

AT Project Sponsor:	Print Name:	Signature:	Phone No.:	
<input type="checkbox"/> RFP for AT <input type="checkbox"/> Engaged by MD/County <input type="checkbox"/> Other (Explain)	Description of Project:			
AT Main Office Contact:			Phone No.:	
FILE NUMBERS / DESCRIPTION / DRAWINGS (Project Sponsor must complete)		Required x	To Be Completed by AT Head Office	
			Code	CRC
				SARC

CONSULTANT / CONTRACTOR:

FAX THE FORM TO 403 – 427 - 3905

- **Consultants / Contractors will only be contacted if the request cannot be filled by the requested time.**
- **If Engaged by a Municipal District / County to do road / bridge work, please fax the Letter of Authorization with your Request for Corporate Information. If not received, your request will not be filled until we have documentation.**

The information provided by Alberta Transportation is provided in confidence and shall not be used or disclosed either directly or indirectly except for:

- purposes necessary for the performance of services under contract;
- the preparation of proposals to Alberta Transportation

The following information is being collect under the authority of the Government Organization Act and will be used to track the access of corporate information. It is protected by the privacy provisions of the Freedom of Information and Protection of Privacy Act. If you have any questions about the collection, contact the Records Program Coordinator, 4999 – 98 Ave. Edmonton, 403-427-0040.

Name of Representative to be viewing records:		Phone No.:
Company Name: Prime Consultant / Contractor ___ or Sub Consultant / Contractor ___		
Sub to which Prime Company: (if applicable)		
Date Requested:		Date Required: am pm
Check Out: (Consultant's signature):		Date:
Check In: (Records Technician signature):		Date:

How do I get access:

There are two sections to this form:

- Section 1 - Alberta Transportation to complete
- Section 2 – Consultant / Contractor to complete

Section 1:

Project Sponsors are required to fill out the following pieces of information:

- Name and Signature as well as their Phone Number
- Check off the type of request and the Description of the Project
- File Numbers / Description / Drawings – be as complete as possible in your request (ie: Bridge file 74458 from 1965 to 1998; Hwy 63 Control Section :02 to :06) The clearer and more detailed the description of what is wanted the quicker the files can be located.

AT Main Office will complete the following:

- Main Office contact and their Phone Number
- Code (as per guidelines sent out under separate cover)
- Check whether the information is stored in the CRC or SARC. If stored in SARC, then give volume numbers of the files along with the relevant location numbers.

Section 2:

Consultant (s) / Contractor (s) will complete the following:

- Name of Representative and Phone Number
- Company Name (please indicate whether you are the Prime Consultant / Contractor or a Sub
- If the Company you represent is a Sub, indicate the Prime Consultant / Contractor
- Date Requested, Date Required (circle either am or pm)

Once the form is completed:

- Fax the completed form to the Corporate Records Centre - 427-3905
- The Corporate Records Centre will forward the request to the relevant area who will review the request and complete the form the rest of the form
- The form is then directed back to the Corporate Records Centre.

How quickly do I get access and where do I go for the records:

- Upon receipt of the approved form, Corporate Records Centre staff will determine the approximate time involved to complete the request, which will be based on the “required time” and internal work loads (Maximum 48 hours).
- The requestors will only be contacted if the request cannot be filled by the requested time.**
- Bookings will be done on a first come, first serve basis with up to four individuals in the room at the same time but working on different projects.
- If more viewing time is required, the requestor can book this through Charlotte Smith (427-7024) or Sheryn Thompson (427-0040)
- No “drop in” requests will be accepted by Corporate Records Centre staff
- To view files, the requestor is to go to the Corporate Records Centre to sign for the records prior to viewing
- Upon completion of review, leave the information in the room, staff will verify that all files have been returned.

Viewing Room Location and Access Hours:

- The Corporate Records Centre - Records Review Room is located on the first floor across from the Corporate Records Centre (South East side of the Twin Atria)
- Viewing hours are from 8:30 am to 4:15 pm. Monday to Friday (Doors will be locked on off hours)
- Photocopies can be made by the requestor in the Corporate Records Centre only (code must be obtained from Corporate Records Centre staff for tracking usage)

PAYMENT VOUCHERS - DIRECTIONS ON USE

The Payment Voucher has been prepared in such a manner that certain fields remain the same, or constant. These fields have been identified in red.

The Payment Voucher is a Word document that is utilized by the Department to identify various types of coding and provides our accounting department a means to enter information into an electronic format.

The Payment Voucher identifies the “vendor” or “payee” by using a 10-digit number, which represents the vendor’s address and other payment criteria.

The consultant will be required to fill in the following fields (using the “tab” key to move to the next available space):

Prepared By – please enter the person’s name that is filling in the form.

Date – enter date the form is being prepared.

Amount Payable – enter total amount payable, less GST (see GST Exemption Clause).

Invoice Date – enter date in MMDDYY format

Invoice ID – enter invoice number

Line 01 Amount – enter amount that will be charged to Engineering Fees1.

Line 02 Amount – enter amount that will be charged to Engineering Disbursements2.

Note – Lines 01 and 02 will add up to total Amount Payable.

Please forward the completed Payment Voucher along with your invoice and other supporting documents to Attn: Project Sponsor or, should you choose, the completed form can be forwarded by e-mail to *projectsponsor’sfirstname.projectsponsor’slastname@gov.ab.ca*.

For any questions regarding the completion of this form and account status please contact the Project Sponsor’s Administrative Assistant.

1 Engineering Fees – Includes payments to architects, engineers, draftsmen, testing and related costs.

2 Engineering Disbursements – Includes payments for services that involve a combination of people, materials and business services not identified in Engineering Fees.

Payment Voucher Completion Guide for Consultants

1) Complete the **“Payment Voucher”** as follows:

- **(A) Business Unit:** Hard Coded 169A
- **(B) Voucher ID:** Leave Blank
- **(C) Prepared by:** Name of the person who prepared payment voucher
- **(D) Date:** the date you prepared the voucher

2) Complete the **“Invoice Header Information”** as follows:

- **(E) Vendor #:** Department Supplied
- **(F) Terms:** as directed
- **(G) Amount Payable:** Actual Amount Payable
- **(H) Accounting Rule:** N/A
- **(I) Invoice Date:** Enter the invoice date in the standard format of “mm-dd-yy”.
- **(J) Factor to Vendor Number:** N/A
- **(K) Invoice ID:** Enter the invoice number (Please Note: for “Contracts” use contract number and estimate number) example: 1234/00Est1
- **(L) Expenditure Officer Approval:** Department Use
- **(M) Date:** Date Expenditure Officers signs
- **(N) Payment Message:** Enter additional information that will be printed on the remittance advice (limited to 30 characters). example: Hwy No. and CE No

3) Chart Fields

- **(O) Amount:** Dollar amount
- **(P) Account** – Defines the expenditure – will be supplied by Project Sponsor
example: 543060 (for CE agreements)
535030 (for construction contract payments)
215031 (for holdback)
- **(Q) Fund** – Defines operating or capital – will be supplied by Project Sponsor
example: 01 or 02
- **(R) Org** – Defines the departmental office where request was originated.
- **(S) Program** – Defines the program(s) where the payment is to be charged– will be supplied by Project Sponsor
- **(T) Project** – Refer to the Job Number for which the expenditure is to be applied – will be supplied by Project Sponsor
- **(U) Task** – Defines the task performed – will be supplied by Project Sponsor as well as additional Task and Activity Coding Information
- **(V) Activity** – Defines the action performed – will be supplied by Project Sponsor as well as additional Task and Activity Coding
- **(W) KMs** – N/A
- **(X) KM Code** – Department use
- **(Y) Tax Code** – Department use
- **(Z) 1099 Code** – N/A
- **(AA) Contract** – Enter the CE number example: CE123/99 or the contract number example: 1234/01
- **(BB) Employee No.** – Department use

APPENDIX L

A TRANSPORTATION

PAYMENT VOUCHER

Page 1 of

BUSINESS UNIT 169A (A)		VOUCHER ID (B)		PREPARED BY: (C)	DATE: (D)
VENDOR # (E)					
TERMS (F)	AMOUNT PAYABLE (G)			ACCOUNTING RULE (H)	
INVOICE DATE (M M - D D - Y Y) (I)		FACTOR TO VENDOR NUMBER (J)	EXPENDITURE OFFICER APPROVAL: DATE: (L) (M)		
INVOICE ID (K)					
PAYMENT MESSAGE (N)				DUE DATE	HANDLING CODE

Line	Amount	Account		Fund	Org	Program
01	(O)	(P)		(Q)	(R)	(S)
		Project	More...	Task	Activity	
		(T)		(U)	(V)	
KMs	KM Code	Tax Code	1099 Code	Contract	Employee	
(W)	(X)	(Y)	(Z)	(AA)	00E(BB)	

Line	Amount	Account		Fund	Org	Program
02						
		Project	More...	Task	Activity	
KMs	KM Code	Tax Code	1099 Code	Contract	Employee	
					00E	

Line	Amount	Account		Fund	Org	Program
03						
		Project	More...	Task	Activity	
KMs	KM Code	Tax Code	1099 Code	Contract	Employee	
					00E	

Line	Amount	Account		Fund	Org	Program
04						
		Project	More...	Task	Activity	
KMs	KM Code	Tax Code	1099 Code	Contract	Employee	
					00E	

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APPENDIX “M”

LIST OF REFERENCES

APPENDIX M

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LIST OF REFERENCES

Alberta Acts and Regulations are available on the internet at www.qp.gov.ab.ca or for purchase at Queen's Printer Bookstore, 11510 Kingsway, Edmonton, Alberta & Main Floor, 455 6th St. S.W., Calgary, Alberta. Federal legislation is available on the internet at www.canada.justice.gc.ca.

NO.	ACT / REGULATION*	DATE Amended	AUTHOR
1.	Canadian Environment Assessment Act		Government of Canada
2.	Canadian Environment Protection Act	1999	Government of Canada
3.	Canada Fisheries Act		Government of Canada
4.	Canada Transportation Act		Government of Canada
5.	Migratory Birds Convention Act		Government of Canada
6.	Navigable Waters Protection Act		Government of Canada
7.	Dangerous Goods Transportation and Handling Act	1999	Province of Alberta
8.	Engineering, Geological and Geophysical Professions Act General Regulation (Alberta Regulation 150/99)*		Province of Alberta
9.	Environmental Protection and Enhancement Act	1998	Province of Alberta
10.	Expropriation Act	1996	Province of Alberta
11.	Forest and Prairie Protection Act	1994	Province of Alberta
12.	Forests Act	1996	Province of Alberta
13.	Freedom of Information and Protection of Privacy Act Freedom of Information and Protection of Privacy Regulation (Alberta Regulation 200/95)*	1999 2001	Province of Alberta
14.	Gas Distribution Act	1998	Province of Alberta
15.	General Safety Regulation (Alberta Regulation 448/83)*	2000	Province of Alberta
16.	Highway Traffic Act	1999	Province of Alberta
17.	Historical Resources Act	1997	Province of Alberta
18.	Land Titles Act	1999	Province of Alberta
19.	Motor Transport Act	1995	Province of Alberta

APPENDIX M

NO.	ACT / REGULATION*	DATE Amended	AUTHOR
20.	Municipal Government Act	1999	Province of Alberta
21.	Natural Resources Conservation Board Act	1997	Province of Alberta
22.	Occupational Health and Safety Act	1994	Province of Alberta
23.	Pipeline Act Pipeline Regulation (Alberta Regulation 122/87)*	1995 1999	Province of Alberta
24.	Public Highways Development Act	1994	Province of Alberta
25.	Public Lands Act	1998	Province of Alberta
26.	Public Works Act	1996	Province of Alberta
27.	Railway Act	1996	Province of Alberta
28.	Safety Codes Act		Province of Alberta
29.	Soil Conservation Act	1988	Province of Alberta
30.	Surveys Act Survey Regulation (Alberta Regulation 94/2000)*	1999	Province of Alberta
31.	Water Act	1999	Province of Alberta
32.	Weed Act		Province of Alberta
33.	Wildlife Act		Province of Alberta

ACTS ADMINISTERED BY ALBERTA TRANSPORTATION

Primary Responsibility

1. Canadian Airlines Corporation Act
2. Central Western Railway Corporation Act
3. City Transportation Act
4. Dangerous Goods Transportation and Handling Act
5. Government Organization Act, Schedule 14
6. Highway Traffic Act [except section 14(1)(b) – in common with Municipal Affairs]
7. Motor Transport Act [except section 15 – in common with Government Services]
8. Motor Vehicle Administration Act
9. Off-Highway Vehicle Act
10. Public Highways Development Act [except sections 14 to 18 and 19(a) and (d) – in common with Municipal Affairs]
11. Railway Act
12. Regional Airports Authorities Act
13. Traffic safety Act (proclaimed in part on November 2, 1999)

Shared Responsibility

1. Government Organization Act:
 - Schedule 12[except section 14] in common with Infrastructure
2. Public Works Act in common with Infrastructure
3. Water, Gas and Electric Companies Act:
 - Section 4 in common with Energy

APPENDIX M

No.	OTHER KEY TECHNICAL REFERENCES	DATE PUBLISHED	AUTHOR
31	A Guide to Electronic Surveying & Data Management	1996	AT
32	A Policy on Geometric Design of Highways and Streets	2001	AASHTO
33	A.T. In-House Developed Software Package (miscellaneous engineering tasks)	1996	AT
34	Aggregate Sources Listing	1997	AT
35	Alberta Highway pavement Marking Guide	1999	AT
36	Alberta Infrastructure Guidelines for Assessment, Rating and Prioritization of Pavements for Seal Coat	1997	AT
37	Alberta Primary Highway Traffic Volume and Vehicle Classification, Travel & ESAL Report	Current	AT
38	Alberta Primary Highway Traffic Volume History Report (1991-2000)	2001	AT
39	Alberta Traffic Collision Statistics	Current	AT
40	Alberta Transportation Utility Guidance Manual	2001	AT
41	American Association of State Highway and Transportation Officials (AASHTO) - Provisional Standards and Volume II Test	1995	AASHTO
42	American Society for Testing and Materials (ASTM) Specifications (vol. 04.01, 04.02, 04.03, 04.04, 04.08, 05.01, 06.01, 08.01, 08.02, 09.01)	1996	ASTM
43	An Outline of Procedures for Hiring Consultants	1998	AT
44	Asphalt Institute Manual Series	Current	Asphalt Institute
45	Benefit Cost Analysis (Summary, Guide and User Manual)	1991	AT
46	Borrow Excavations C & R/IL/00-3	2000	Alberta Environment
47	Bridge Code on Fabrication of Structural Steel	1996	AASHTO
48	Bridge File Maps (by Municipality) (photo grade paper)	1995	AT
49	Bridge File Maps (by NTS Grid) (photo grade paper)	1995	AT

No.	OTHER KEY TECHNICAL REFERENCES	DATE PUBLISHED	AUTHOR
50	Bridge Inspection & Maintenance System Manual	1990	AT
51	Bridge Inspection Manual (BIM)	2001	AT
52	Bridge Maintenance Standards for Local Road Authority	1993	AT
53	Bridge Rating - New Rating Truck Models Version 1.00	1997	AT
54	Bridge Size Culverts (Installation Video)	1995	AT
55	Bridge Size Culverts Design & Draft Guidelines	1995	AT
56	Bridge Structures Design Criteria Version 4.0	2001	AT
57	Bridge Welding Code D1.5	1996	A.W.S.
58	Canadian Foundation Engineering Manual (3rd Edition)	1993	Canadian Geotechnical Society
59	Canadian Highway Bridge Design Code	2000	Canadian Stds. Assoc.
60	Canadian Standards Association CSA (CAN A23.1, CAN A23.2, CAN 3-A5)	1994	CSA
61	Canadian System of Soil Classification	1987	Agriculture Canada
62	Code of Practice for Asphalt Paving Plants	1996	Alberta Environment
63	Code of Practice for Watercourse Crossings	2000	Alberta Environment
64	Conservation and Reclamation Guidelines for Alberta C & R/IL/97-1	1997	Alberta Environment
65	Contract Maintenance of Provincial Primary Hwys. (large) (70 x 120cm)	Current	AT
66	Contract Maintenance of Provincial Primary Hwys. (small) (45 x 80cm)	Current	AT
67	Cost Apportionment Guidelines - for railway crossings	1990	Government of Canada
68	Disposal of Excess Soil Material from Roadways C & R/IL/00-10	2000	Alberta Environment
69	Drafting Guidelines (CB4)	July 1995	AT

APPENDIX M

No.	OTHER KEY TECHNICAL REFERENCES	DATE PUBLISHED	AUTHOR
70	Engineering Consultant Guidelines for highway and Bridge Projects – Volume 2 – Construction Contract Administration	2001	AT
71	Environmental Protection Guidelines for Pits C & R/IL/96-5	1996	Alberta Environment
72	Environmental Protection Guidelines for Roadways C & R/IL/00-5	2000	Alberta Environment
73	Environmental Self-Assessment of Rail Infrastructure Projects	Draft July 2001	Canadian Transportation Agency
74	Erosion Control Reference Material	2001	AT
75	Excavation and Construction near Pipelines	Jan. 1997	National Energy Board
76	Fish Habitat Manual	2001	AT
77	Geometric Design Guide for Canadian Roads Part 1 & 2	1999	TAC
78	Geotechnical Instrumentation Manual	Nov. 1995	AT
79	Guide for Design of Roadway Lighting	1983	TAC
80	Guide to Bridge Hydraulics	2001	TAC
81	Guide to Railway Works Cost Apportionment	Apr. 1997	Rail Infrastructure Directorate
82	Guidelines for Assessment, rating and Prioritization of Seal Coat	1997	AT
83	Guidelines for Bridge Structures, Standards, Approvals, and Design (SAD Guidelines)	1992	AT
84	Guidelines for Consulting Geotechnical Assignments	1995	AT
85	Guidelines for Meeting the Requirements of an Owner ¹ on Construction Project	1996	AT
86	Hazard Assessment Manual	1995	AT
87	Highway Capacity Manual (Transportation Research Board)	2000	TRB, FHWA, USA

No.	OTHER KEY TECHNICAL REFERENCES	DATE PUBLISHED	AUTHOR
88	Highway Drainage Guidelines (Metric Versions)	1999	AASHTO
89	Highway Geometric Design Guide	1999	AT
90	Highway Maintenance Specifications & Standards	2001	AT
91	Highway Maintenance Specifications & Stds. (Short Version)	1998	AT
92	Highway Signing Policy Manual	1986	AT
93	Highway Standard Plates CB-6 Standards	1999	AT
94	Illumination of Isolated Rural Intersections	2001	TAC
95	ITE Trip Generation Manual (5th Edition)	1991	ITE
96	Land Surveyor's Manual of Standard Practice	Apr. 1996	Alta. Land Surveyor Association
97	Manual for Test Procedures	1997	AT
98	Manual of Uniform Traffic Control Devices for Canada	1996	TAC
99	Navigable Waters Protection Act Procedure Manual	2001	AT
100	Pavement Design Manual	1997	AT
101	Pavement Surface Summary (Primary Highways)	Current	AT
102	Pavement Surface Summary (Secondary Highways)	Current	AT
103	Paving Guidelines & Segregation Rating Manual	2001	AT
104	Pedestrian Crossing Control	1998	TAC
105	Preliminary Survey and Design Requirements for Highway Projects Undertaken by Consulting Engineers	1995	AT
106	Primary Highway Progress Chart	Current	AT
107	Primary Highway Status Summary	Current	AT
108	Records Retention and Deposition Schedule 1994/059-A3	Current	AT
109	Report 350, Recommended Procedures for the Safety Performance of Highway Features	1993	NCHRP ²

APPENDIX M

No.	OTHER KEY TECHNICAL REFERENCES	DATE PUBLISHED	AUTHOR
110	Road/Railway Crossing Guidelines	May 1997	AT
111	Roadside Design Guide	Jan. 1996	AASHTO
112	Schedule of Signs	Feb. 1995	AT
113	Signing Pattern Manual	1986	AT
114	Specification Amendments and Supplemental Specifications for Highway Construction (5th Edition)	1998	AT
115	Specifications for Bridge Construction	2001	AT
116	Specifications for Poles and Hardware	Apr. 1991	AT
117	Specifications for the Supply of Traffic actuated Intersection Control Assemblies	1995	AT
118	Standard Drawings for Highway Construction	2000	AT
119	Standard for Rotatable Bases (high load corridor)	1983	AT
120	Standard for Signal Equipment and Wiring	May 1995	NEMA ³
121	Standard Highway Construction Drawings (CB-6)	Apr. 1995	AT
122	Standard Specifications for Highway Construction	Current	AT
123	Survey Manual	1988	AT
124	Tailgate Talks (Accident Reduction Effort - Safety)	1994	AT
125	The Expropriation Process	1996	AT
126	Traffic Accommodation in Work Zones	2001	AT
127	Traffic Control Standards Manual	1995	AT
128	Transportation Laboratory Test (TLT) Procedures	2000	AT
129	Turning Movement Training Manual	1994	AT
130	Urban Supplement to the Geometric Design Guide for Canadian Roads	Apr. 1995	TAC

¹ (As defined by the Occupational Health and Safety Act)

² NCHRP National Cooperative Highway Research Program, Federal Highway Administration, USA

³ NEMA National Electrical Manufacturers Association, USA

THIS LIST OF REFERENCES IS NOT ALL INCLUSIVE. THE CONSULTANT / CONTRACTOR IS EXPECTED TO USE THE CURRENT GUIDELINES AND SPECIFICATIONS REQUIRED IN THE COMPLETION OF WORK INVOLVED.

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APPENDIX “N”

DOCUMENTS AVAILABLE THROUGH ALBERTA TRANSPORTATION

APPENDIX N

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PRICE LISTS FOR AT DOCUMENTS

Where a price is shown on the list, the document may be ordered through Business Management Branch.
 Where a price is not shown on the list, please refer to the contact person regarding the availability of the current document.
 Please direct your orders to:

Documents marked on web are available on the Department's website: www.trans.gov.ab.ca

Attention : **Bob Readner**
 Business Management Branch
 ALBERTA Transportation
 4999 – 98 Avenue, 3rd Flr. Twin Atria Bldg.
 Edmonton, Alberta T6B 2X3
 Tel. No. 415-1068, Fax No. 422-0232

ITEM	YEAR ISSUE	SCOPE	BRANCH	CONTACT PERSON	TEL. #	PRICE
A Guide to Electronic Surveying & Data Management	1996	Provides a background history of the survey technology adopted by AT. A comprehensive user guide (Including the Descriptor Code Booklet)	Technical Standards	Sal Hasham	427-2088	50.00
A.T. In- House Developed Software Package	1996	Used for automating the highway survey design/drafting and construction process (Including the Benefit Cost Analysis Spreadsheet)	Technical Standards	Sal Hasham	427-2088	50.00
Aggregate Sources Listing	1997	A listing of Department controlled aggregate sources and prospects. This provides a quick reference to the Dept. controlled lands that contain aggregate or may contain aggregate.	Technical Standards	Bruce Blue	415-1389	100.00
Alberta Primary Highway Traffic Volume History Report (1991-2000) (on web)	2001	Two way traffic volume history on Alberta's Highway Network from 1991 to 2000	Program Management	Peter Kilburn	415-1359	10.00
Alberta Highway Pavement Marking Guide (on web)	1999	Guidelines for design and placement of pavement markings on provincial highways in Alberta	Technical Standards	Richard Chow	415-1050	80.00
Alberta Primary Highway Traffic Volume and Vehicle Classification, Travel & ESAL Report (Updated Yearly) (on web)	Current	Statistical information on Traffic Volumes and Vehicle classifications for Alberta Highways Estimates of Equivalent Single Axle Loading (ESAL) based on traffic volumes for pavement design, and million vehicle-kilometres traveled for collision rates	Program Management	Peter Kilburn	415-1359	10.00
Alberta Traffic Collision Statistics (Updated Yearly) (on web)	Current	Descriptive collision statistics for Alberta	Driver Services	Liz Owens	427-6775	0.00
Alberta Transportation Utility Guidance Manual	2001	Application and procedures for utility placement in highway right-of-way	Technical Standards	Glen Tjostheim	415-1269	65.00

ITEM	YEAR ISSUE	SCOPE	BRANCH	CONTACT PERSON	TEL. #	PRICE
Benefit Cost Analysis (Summary, Guide and User Manual)	1991	Analytical tool that systematically compares the stream of quantifiable benefits generated over the life of a project or program, to the cost incurred	Planning Services	Jim Der	415-1300	100.00
Bridge Inspection Manual (BIM) – Version 2.0	2001	Information and instruction manual for the Bridge Inspection System	Technical Standards	Tom Loo	415-4876	50.00
Bridge Maintenance Standards for L.R. Authorities	1993	Instructions for minor Bridge Maintenance items	Technical Standards	Tom Loo	415-4876	25.00
Bridge Rating - New Rating Truck Models Version 1.00	1997	Background information for the development of the CS rating truck models. Charts allow quick comparison of load effects of CS models and real trucks	Technical Standards	Terry Sexton	415-1024	10.00
Bridge Size Culverts Design & Draft Guidelines	1995	Formalizes the departments practice on design and drafting of bridge size culverts (defined as those with diameters greater than 1.5 m)	Technical Standards	Des Williamson	415-1015	30.00
Bridge Structures Design Criteria Version 4.0	2001	Summary of important criteria for designing efficient and durable bridge structures based on Department past experience	Technical Standards	Clive Clarke	415-1025	10.00
Contract Administration Manual (superseded by Engineering Consultant Guidelines - Volume 2 - December 2001)	1999	Provides Department standards for administration of construction contracts.	Technical Standards	Ian Baird	415-1080	25.00
Contract Administration Manual for Highway and Bridge Maintenance	1999	Gives both new and existing employees in the highway maintenance section a document that can act as a starting point for understanding the duties and responsibilities of employees, demonstrate a consistent approach and philosophy, provide proper protocol for handling issues that may arise from either contract interpretation or work specifications, assist readers in understanding the duties set out by the maintenance contract, and assist readers in understanding what the contractor has agreed to for the duration of his contract.	Technical Standards	Moh Lali	415-1083	25.00
Drafting Guidelines (CB-4)	1995	Assists technologists and engineers involved in the process of surveying, designing, drafting and tendering highway projects. Formalizes drafting standards and plan requirements.	Technical Standards	Tim Normandin	415-1044	40.00
ECO Plan Framework Internet Access Available	2001	This framework is to be utilized for Environmental Construction Operations Plans for all highway and bridge construction and rehabilitation projects for Alberta Transportation.	Professional Services	Neill McQuay	415-1076	15.00
Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 1 – Design and Tender	2001	Provides Department’s expectations for the provision of engineering services for the design and tender of provincial highway projects	Technical Standards	Bill Kenny	415-1048	
Engineering Consultant Guidelines for Highway and Bridge Projects – Volume 2 – Construction Contract Administration	2001	Provides Department standards for administration of construction contracts.	Technical Standards	Ian Baird	415-1080	

ITEM	YEAR ISSUE	SCOPE	BRANCH	CONTACT PERSON	TEL. #	PRICE
Equivalent Single Axle Loading	Current	Presents ESAL history report.	Program Management	Peter Kilburn	415-1359	N/A
Erosion Control Reference Material	2001	General reference on erosion control material, design and AT past experiences.	Technical Standards	Fred Cheng	415-1039	30.00
Fish Habitat Manual (on web)	2001	Guidelines and Procedures for watercourse crossing in Alberta	Civil Projects	Don Snider	415-1387	35.00
Guidelines for Assessment, Rating and Prioritization of Seal Coat	1997	Presents background information and provides guidelines for the Seal Coat Rating System. An on-site inspection, which involves the assessment of 7 attributes of which 5 relate to pavement condition, enable the Department to prioritize potential seal coat projects	Technical Standards	Vijay Ghai	415-1040	0.00
Guidelines for Bridge Structures, Standards, Approvals and Design (SAD Guidelines)	1992	Intended to resolve issues and/or problems associated with the initiation, approval and engineering design of bridge and culvert projects	Technical Standards	Clive Clarke	415-1025	15.00
Guidelines for Consulting Geotechnical Assignments	1995	Establishes procedures for engineering consultants on Geotechnical issues	Technical Standards	Fred Cheng	415-1039	25.00
Hazard Assessment Manual	1995	For supervisors, to assist in accident reduction	Human Resources	Kathy McBain	427-7327	25.00
Highway Geometric Design Guide (on web)	1999	Establishes uniform geometric design standards and procedures to carry out highway design functions	Technical Standards	Bill Kenny	415-1048	100.00
Highway Geometric Design Guide CD Version	1999	Establishes uniform geometric design standards and procedures to carry out highway design functions	Technical Standards	Bill Kenny	415-1048	20.00
Highway Maintenance Guidelines and Level of Service			Technical Standards	Moh Lali	415-1083	25.00
Highway Maintenance Specifications (Version 2)	1998	Contract specifications for primary highway maintenance, including drawings for the work and permanent signing.	Technical Standards	Ian Baird	415-1080	50.00
Highway Maintenance Specifications (Version 2)	1998	Contract specifications for primary highway maintenance – smaller format for portability. No signing plans and drawings.	Technical Standards	Ian Baird	415-1080	35.00
Highway Maintenance Specifications (Version 3)	2000, 2001	Contract specifications for provincial highway maintenance.	Technical Standards	Ian Baird	415-1080	35.00, 35.00
Highway Standard Plates CB-6 Standards (on web)	1999	Standard highway construction drawings	Technical Standards	Bill Kenny	415-1048	140.00
Highway Standard Plates CB-6 Standards CD Version	1999	Standard highway construction drawings	Technical Standards	Bill Kenny	415-1048	20.00
Manual for Test Procedures (on web)	1997	Alberta Transportation Test (ATT) procedures that are referenced in AT construction specifications. ATT test procedures are testing standards used for quality assurance (QA) and in some cases quality control (QC) testing on AT projects	Technical Standards	Dave Heath	415-1010	40.00
Navigable Water Protection Act Procedures Manual (on web)	2001	Step by step guide on how to make an application to the Federal Coast- guard for a Navigable Waters Protection Act Approval.	Civil Projects	Don Snider	415-1387	0.00
Pavement Design Manual (on web)	1997	Provides a comprehensive guideline for surfacing structural design of new construction (including reconstruction & grade widening & rehabilitation on Primary and Secondary Highways in the Province)	Technical Standards	Vijay Ghai	415-1040	50.00

ITEM	YEAR ISSUE	SCOPE	BRANCH	CONTACT PERSON	TEL. #	PRICE
Paving Guidelines & Segregation Rating Manual	2002	Guidelines for the administration and interpretation of Specification 3.50 Asphalt Concrete Pavement - E.P.S. including requirements for pavement segregation.	Technical Standards	Dave Heath	415-1010	25.00
Post Disturbance Reclamation Criteria and Assessment Procedures for Borrow Excavations (DRAFT)	2001	Provides guidance on undertaking a soil and vegetation survey after reclamation of the borrow	Civil Projects	Don Snider/Len Penner	415-1387 427-2097	0.00
Pre-disturbance Assessment Procedures for Borrow Excavations for Road Construction (DRAFT)	2001	Provides guidance on undertaking a soil survey on a borrow excavation prior to disturbance	Civil Projects	Don Snider/Len Penner	415-1387 427-2097	0.00
Primary Highway Status Summary (Updated Yearly) (on web)	Current	1997 Pavement Management System Data including year first based, paved overlay, present condition, predicted need, present ESAL, AADT	Program Management	Moh Ashraf	415-1030	N/A
Road/Railway Crossing Guidelines	1997	Guidelines for road/railway at-grade and grade separated crossing	Technical Standards	Richard Chow	415-1080	20.00
Secondary Highway Status Summary (Updated Yearly) (on web)	Current	1997 Pavement Management System Data including year first based, paved overlay, present condition, predicted need, present ESAL, AADT	Program Management	Moh Ashraf	415-1030	N/A
Signing Pattern Manual	1986	Under Development. Signing Patterns reproduced to exact scale: Regulatory, Warning, Information, Construction and Miscellaneous/Special	Technical Standards	Richard Chow	415-1050	30.00
Specification Amendments and Supplemental Specifications for Highway Construction (on web)	2001	Requisite adjunct to Standard Specification manual, provides additional contractual requirements for AT highway construction contracts. Complementary with purchase of Std. Spec. for Hwy. Construction manual. (Included in the purchase of Standard Specifications For Highway Construction)	Technical Standards	Ian Baird	415-1080	0.00
Specifications for Bridge Construction (on web)	2001	General requirements and standard specifications for bridge construction	Technical Standards	Greg Whyte	415-1011	35.00
Standard Drawings for Highway Construction	2000	Referenced and requisite component of AT contracts. Standard drawing supplement specifications with accurate measurements and dimensions for construction.	Technical Standards	Ian Baird	415-1080	25.00
Standard Specifications for Highway Construction (on web)	2001	Contract specifications for highway construction.	Technical Standards	Ian Baird	415-1080	35.00
Survey Manual	1988	Instructional guide for surveyors working on construction projects. Standardizes procedures for different crews.				25.00
Tailgate Talks (Accident Reduction Effort - Safety)	1994	Assist in accident reduction	Human Resources	Kathy McBain	427-7327	25.00
Traffic Accommodations in Work Zones (on web)	2001	Outlines general considerations for developing an effective traffic accommodation strategy and provides guidelines for the use of various Traffic Control Devices.	Technical Standards	Sal Hasham	427-2088	65.00
Traffic Accommodations in Work Zones CD Version	2001	Outlines general considerations for developing an effective traffic accommodation strategy and provides guidelines for the use of various Traffic Control Devices.	Technical Standards	Sal Hasham	427-2088	15.00

ITEM	YEAR ISSUE	SCOPE	BRANCH	CONTACT PERSON	TEL. #	PRICE
Transportation Laboratory Test Procedures (on web)	2000	Contains all Transportation Laboratory Test (TLT) procedures referenced in the AT construction specifications and Highway Maintenance Specification Manuals. The TLT test procedures are testing standards to be used for quality assurance (QA) testing and design of AT projects.	Technical Standards	Marta Juhasz	415-0691	40.00
Utility Guidance Manual	2001	standards and requirements for installation of utilities in highway rights-of-way	Technical Standards	Glen Tjostheim	415-1269	65.00
MAPS (Orders can be made directly through Technical Standards Branch – Geographic Information Systems)						
Bridge File Maps (by Municipality) (photo grade paper)	1995	Shows all Bridge Size Structures by category	Technical Standards	Wilf Schneider	415-1042	25.00
Bridge File Maps (by NTS Grid) (photo grade paper)	1995	Shows all Bridge Size Structures by category	Technical Standards	Wilf Schneider	415-1042	25.00
Contract Maintenance of Provincial Primary Hwys. (large) 7(0x120cm)	Current	Map showing Contract Maintenance Areas, corresponding control section numbers and lengths in kilometers, maintenance shop locations	Program Management	Merv Henning	415-1043	27.00
Contract Maintenance of Provincial Primary Hwys. (small) (45x80cm)	Current	Map showing Contract Maintenance Areas, corresponding control section numbers and lengths in kilometers, maintenance shop locations	Program Management	Merv Henning	415-1043	27.00
Primary Highway Progress Chart – Hwys 1-216	Current	Wall size map (86x140cm) showing surface classification, control section numbers and kilometre lengths for the Provincial Primary Hwy. System	Program Management	Merv Henning	415-1043	27.00
Primary Highway Progress Chart – Hwys 500-986	Current	Wall size map (86x140cm) showing surface classification, control section numbers and kilometre lengths for the Provincial Primary Hwy. System	Program Management	Merv Henning	415-1043	27.00

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